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PROF. BILES ON LARGE SHIPS.

Prof. J. H. Biles, addressing the students of naval architecture at Glasgow University on Oct. 30, said this year would likely be known for a long time as the year of big ships. The three largest warships in the world—the Dreadnought, the Lord Nelson and the Agamemnon—had been launched, and the three largest mercantile steamers in the world—the Lusitania, the Mauretania and the Adriatic—had been transferred from land to water with ease and certainty that could not have been excelled if launches of the magnitude had been everyday occurrences. The economy of big things was inevitably establishing itself in the shipping world. A battleship or an Atlantic liner only required one captain and one chief engineer, whether she were 1,000 tons or 30,000 tons. There could be only one officer in charge on deck and only one in charge below. No doubt the larger ships required more officers and men to work them, but not in proportion to their increase of size or earning power. Hence, the nation or business concern that could afford to build ships larger and larger could keep the lead and advantage over those who could not.

After dealing exhaustively with the development of which the Dreadnought is the highest example, Dr. Biles proceeded to discuss the progress of the merchant ship towards the Lusitania and the Mauretania. It had, he said, a political as well as an engineering history. In the dull days of American finance, when New York reached out long arms and big hands to grasp the commerce of the world, it combined the principal American and British steamers. Famous lines like the White Star, the Dominion, and the Leyland were included, and the American, the Red Star, and other lines as well. One important Atlantic line which was not grasped in the big hand naturally became alarmed, and the public shared its alarm. To such an extent, indeed, did

the public share its alarm, that the government appointed a committee to inquire into the relation of speed and subsidy. The country was threatened, on the one hand, with a high speed in German passenger ships which was stealing its trade, and on the other by Americans, who were buying up its ships. The German menace was not only a pace-breaking one; at that time Britain had no cruiser which could steam as fast as some of the mail steamers of the German lines, and some people feared that these merchant ships of high speed let loose on the seas would be a serious menace to British commerce in time of war.

All these considerations induced the government of the day to come to the assistance of the Cunard company by lending it money at a very low rate of interest and agreeing to pay it a subsidy in consideration of attainment of the speed of a knot to a knot and a half more than that of any existing passenger steamer. He happened to have been a member of the committee that considered the question of the relation of subsidy and speed, and he knew it was never intended that the subsidy should by itself insure a profit to the ship owner. It was intended to make the attainment of a higher speed commercially possible, but it could only be a part of that which was to make commercial success. The vessels with which the Lusitania would compete had been evolved from much smaller types, carrying smaller numbers of passengers. If increase of speed only had been desirable much smaller vessels than the Lusitania might have answered the purpose, but it was of little use to have high speed ships unless passengers in sufficient numbers could be attracted to them to make them pay, and with the increase of speed must follow the increased number of passengers necessary to meet the rapidly growing expenses of increased speed. Consequently, they found in the Lusitania passenger accommodation on an unprece-

dent scale, both as to quality and quantity.

Time would show whether this accommodation would be fully taken advantage of by the traveling public, and whether the numbers of passengers who traveled would come from the huge populations which had not yet begun to travel, or whether they would come from the old passengers who at present traveled on other lines. New ships were like other new things. They excited curiosity. People ran after them because they were new. No doubt these enormous passenger ships would attract considerable numbers of old passengers, and, it was to be hoped, also a considerably greater number of customers who had never traveled before.

The problem of propulsion was, Prof. Biles went on to say, quite as serious as that of the size and accommodation of the ship. In the development of the reciprocating marine engine a stage had been reached where the machinery of the steel manufacturer had failed to overtake the requirements of the engineer constructor. The ability to produce with certainty and reliability propeller shafting of the size necessary for the power required was not in existence, and the problem of putting sufficient accommodation into a ship to make it commercially successful seemed to be rendered impracticable by the limitations of steel manufacture.

The only method of reducing the size of these enormous propeller shafts was to increase the revolutions and the reciprocating engine had already reached a limit where the relation between the moving masses and their strengths could not be passed. The alternative was to take the turbine. This was an undertaking involving experimental risks in many directions. Turbines had been applied to channel steamers and to small war vessels. These had been more or less in the nature of experiments, and no vital interests were endangered by the chance of failure. Many mechani-

cal problems had, however, to be considered before the great step involved in passing from turbines of 10,000 H. P. to turbines of 70,000 H. P. could be approved. Not only was the power very much greater, but the revolutions at which the power could be obtained were, from the nature of the case, very much less, so that the turbine itself had to be a much larger size, involving many problems of the effect of heat expansion and centrifugal forces upon steel structures rotating to high speed. Fortunately, an intermediate step presented itself, and steamers of much smaller power had turbine machinery fitted to them with successful results, so that though the decision to adopt turbines for the high-speed ships had to be taken in spite of all dangers, the experience with these smaller liners had not been without service.

AN OLD CHINESE WAR JUNK CASE.

About a year ago the old Chinese war junk Whang Ho, was purchased of the Chinese government by W. M. Milne, of Los Angeles who paid a good round price therefor. The vessel was purchased merely to be placed on exhibition at one of the noted summer watering resorts of southern California. After a long, stormy and very eventful voyage from Woo Sung, the Whang Ho arrived recently at Port Angeles.

Soon after sailing, the Whang Ho struck a typhoon and had to go to Japan for a new rudder. Finally, her captain had to convince the Japanese authorities that Korea was not its destination. After leaving Kagosima, Capt. Hansbor died, and Chief Officer Walter Lobger assumed command.

The Whang Ho is said to be nearly a century old. Originally the old junk was a pirate chaser—carrying 8 cannon and 150 guns. And now the customs authorities will not permit the old junk to land, and she is being held pending a decision on the vessel's right of entry. The charge is made that the Whang Ho being of foreign construction and domicile, has no right to enter an American port flying the American flag. The case is now in the hands of the Secretary of the Treasury.

NEW PERUVIAN CRUISER ALMIRANTE GRAU.

The trials have just been completed of the cruiser Almirante Grau, built for the Peruvian navy by Messrs. Vickers Sons & Maxim, Ltd., at Barrow-in-Furness, and there has also just been launched from the same yard her sister ship Coronel Bolognesi. Both these

ships are of an improved "scout" type, and indicate that the Peruvian government is making an effort to resuscitate its navy. The Almirante Grau and Coronel Bolognesi are sister ships, with this exception—that in the former there is a poop whereby the accommodation is largely increased, the intention being that this vessel shall act as the flagship of the navy; the vessel is thus about 20 tons greater in displacement than the other ship. The length is 370 ft.; the beam 40 ft. 6 in.; and the draught is limited to 14 ft. 3 in. in order that the vessel may enter all the Peruvian harbors. The displacement at this draught is 3,200 tons. For protection there is placed an armored deck over the magazines, steering gear and machinery. The coal bunkers are arranged along the sides of the boiler compartments and over the machinery room, thus adding to protection and minimizing possible penetration by shot and shell. The conning tower is of 3-in. armor. The armament of the ship includes bow and stern 6-in. guns with protecting shields. These guns have an arc of training of 270 degrees. Ammunition is supplied by electric hoists of the dredger type, protected by armored tubes. All the mechanism is arranged to give the greatest possible rapidity of fire. The secondary armament consists of eight 14-pounder guns, and eight 1¼-pounder guns. There are two submerged tubes for firing 18-in. torpedoes. The flagship will have a complement of 300 officers and men, and special arrangements are provided in view of the variations in climate in South American waters. Although the ship is small baths are provided in all the living quarters, together with a perfect system of ventilation. There is also a mechanically equipped bakery on board, so that the vessel excels many warships of much greater size in the elements conducive to comfort.

The machinery consists of two four-cylinder, triple-expansion engines, balanced on the Yarrow-Schlick-Tweedy system. These engines are designed to give a collective indicated horsepower of 14,000, with a steam pressure at the engines of 250 lbs. per sq. in., the safety valves in the boiler being loaded at 280 lbs. There are ten water-tube boilers on board, arranged in three separate compartments, and worked under the closed stokehold system. The specifications required that during the trials the Almirante Grau, as well as her sister ship, should steam six runs over the measured mile, and that the mean speed should be 24 knots. In the event of the speed being 1.5 of a mile per hour less, the ship was liable to be rejected. This performance was easily exceeded, the

speed obtained being 24.641 knots, with the engines making 216 revolutions, and developing 14,144 I. H. P., a result suggesting high efficiency. There was not the slightest difficulty either in the engine or in the boiler room, and Admiral Carvojal, the head of the naval commission, who has superintended the construction of the ship, was on board, and expressed his high appreciation of the splendid performance of the ship, and particularly the absence of vibration. On Sept. 21 the vessel proceeded on a 24 hours' endurance test, which was divided into four successive periods, the power being increased in each period: The coal consumption was taken and the results are given as under:

	First six hours.	Second six hours.	Third six hours.	Fourth six hours.
Mean I. H. P.	913	3,689	6,342	8,817
Mean coal con., lbs. ...	2.27	1.45	1.68	1.635

These coal results are very favorable. During the trials an opportunity was afforded of testing the wireless telegraph installation on board the ship, and messages were received on board over a distance of 150 miles. The Coronel Bolognesi was launched on Saturday, Sept. 22, after the above trials had been completed. Both vessels will be completed ready for war service by the Vickers firm, even to the provision of shot, shell and powder.

WILL START A NEW SERVICE.

It has just been officially announced that the American-Hawaiian Steamship Co.'s big liner Arizonian would be the first vessel to inaugurate the new itinerary between San Francisco and Salina Cruz. This new freight service contemplates the bringing of New York freight to San Francisco via the Isthmus of Tehautepec.

The American-Hawaiian Steamship Co. has entered into an agreement with the Tehautepec Mexican Railway Co., whereby its freight will be transferred over land from Salina Cruz on the Pacific side, to Coat Sacolcos, the port on the Gulf of Tehautepec. The Arizonian will soon carry the first cargo to Salina Cruz. She is now loading on Puget Sound. She will then go to Honolulu and take on sugar for Salina Cruz. With the inauguration of the new service, the "around the Horn" voyages will be discontinued.

The Inland Seamen's Union, which is comprised of 375 captains controlling 450 canal boats plying between New York and Canada, through Lake Champlain, has ordered a 600-H. P. power tug to be delivered in spring, 1907, to operate in competition with the Champlain Transportation Co.

OHIO RIVER IMPROVEMENT ASSOCIATION.

(Concluded.)

At the annual meeting of the Ohio River Improvement Association held at Portsmouth, President John F. Vance spoke in his annual address concerning the National Rivers and Harbors Congress as follows:

THE NATIONAL RIVERS AND HARBORS CONGRESS:

Before coming directly to what I desire to say concerning this organization, a brief resume of its history is proper. A convention assembled at Baltimore, Md., October 8, 1901, in pursuance to a call issued from New Orleans, which stated: "The primary object of this congress is the initiation of action having for its end the continuance of such national policy in the matter of the improvement of rivers and harbors as will secure to our country at large the prompt development of its great producing, industrial, commercial, maritime and transportation possibilities."

The second object, and no less important than the first, was to emphasize the protest of the commercial interests of the country concerning the action of a United States senator, who, under the peculiar rules of that body, was able, in the closing hours of its last session, to deliberately destroy the rivers and harbors bill of 1901 which had been by the committee on rivers and harbors presented to the house of representatives and passed by the lower house by a handsome majority.

That convention was a success from every standpoint. There were represented 21 of the states of the union, and the character, standing and personnel of the delegates left nothing to be desired. The convention after passing suitable and strong resolutions and appointing an executive committee to carry on the work of the congress, adjourned.

The executive committee thus appointed, I regret to say, and the statement is made in no spirit of criticism, took no action towards perpetuating the organization.

In May, 1905, occurred the memorable "Tour of Inspection" of the Ohio river by the rivers and harbors committee of the house of representatives, as guests of our association. I say "memorable" for that tour made then, and is continuing to make, history to rivers and harbors improvement matters, and in this city of Ports-

mouth, on the night of Friday, May 12, were the words spoken, and again reiterated the following night at Cincinnati that called into active existence the "National Rivers and Harbors Congress," which had lain dormant since October 10, 1901. Those words were spoken by the Hon. Joseph E. Ransdell, who by the congressional record is accredited to the 5th district of Louisiana, but whom we know to be not a "District Congressman" but a "National Congressman," and who is our honored guest today. Mr. Ransdell was then, as he is now, a member of the rivers and harbors committee.

Mr. Ransdell, in his address delivered at the banquet given by the citizens of Portsmouth to his committee, called attention to the necessity of arousing a great public sentiment favorable to river and harbor appropriations, saying that until such a sentiment was aroused throughout the union, he saw but little hope that appropriations for such improvements would be either regular or increased.

Mr. Ransdell, by special request of some of the members of his own committee, repeated this speech at Cincinnati the following evening, and closed by suggesting that the Ohio Valley Improvement Association, which he was kind enough to characterize as the strongest and best organized waterway improvement association in the United States, call a conference of kindred organizations and arrange for a national convention having for its purpose the cementing of all interests favorable to river and harbor improvements into one compact organization which, united, should work, not for any special project or section, but for the sole and only purpose of bringing to bear such a sentiment of the commercial, manufacturing and kindred organizations of the country, upon congress, as would force river and harbor appropriations out of its present rut of triennial bills, and place it upon a regular increased and permanent basis, as are other government appropriations.

Some of the results of Mr. Ransdell's suggestions you are entirely familiar with. Briefly, this association readily assumed (as it has ever done, any suggestions coming from a congressional source, that would benefit, not only our particular project but all waterway improvement projects, no matter where located) the duty of calling the conference, and on June 29 and 30, 1905, there assembled in Cincinnati, delegates from twelve states representing 26 organizations.

directly formed for waterway improvement or favorable thereto.

To the attention of this conference there was authoritatively brought the information that the National Rivers and Harbors Congress was still in existence and should call the national convention, and a joint conference between a committee appointed by the Cincinnati conference and a committee representing the executive committee appointed by the Baltimore convention of 1901, resulted in an agreement to turn the matter of calling the Washington convention, over to the executive committee of the National Rivers and Harbors Congress.

This brings the National Rivers and Harbors Congress up to the convention held at Washington, January 15 and 16, 1906, which convention, from the true history here given, you will agree with me was, under the suggestion and inspiration given by Mr. Ransdell, due primarily to the Ohio Valley Improvement Association.

The Washington convention was a most successful one, and illustrated forcefully that there was a strong sentiment throughout the union favorable to river and harbor improvements, which only needed intelligent and careful cultivation to grow into such a force and volume as would make its just and reasonable demands listened to and accorded by the lawmakers of the general government.

Twenty-three states were represented by nearly 600 delegates, among whom were many men with a national reputation both in politics and commercial life.

The most important action taken by the convention, and one that has already shown, and is destined to show still further, widespread significance and importance, was the reorganization of the National Rivers and Harbors Congress, by the formation of an executive committee of fifteen of the most able and influential men of their respective localities, which localities are scattered from Massachusetts to Texas, and from Texas to California and Oregon, and take in the great inland waterways, both lake and river.

To this executive committee was given plenary power to bring about an organization which should be national in fact as well as in name, and national in power, truly representative of every section and state in the union.

This committee, headed by the man of all men who had done more to bring its formation about, and who of all had less thought of being its head, Hon. Joseph E. Ransdell, assumed readily, without hope of personal

reward or recompense, the work committed to their care. J. F. Ellison, of our association, was made secretary and treasurer of the committee, and Hon. Albert Bettinger and Capt. Wm. B. Rodgers, leading members of our association, are members of the committee.

Work, active, systematic and intelligent, was immediately commenced, and has continued, and I, who have spent the past twelve years of my life in this class of work, bear cheerful witness that that work has been effective, and you and I and all friends of the Ohio river, in common with all other legitimate waterway improvement projects, will be benefited by it.

They have established bureaus of publicity in Washington, New York, and Chicago, whose duty it is to disseminate information and to use truthful and legitimate arguments showing that all sections of our common country are interested in, and will be benefited by, improvement of our waterways and harbors; that the communities lying inland will receive proportionately as much benefit as those lying directly upon or contiguous thereto.

Mr. Ransdell has visited the Atlantic coast—New York, Philadelphia, Norfolk, Wilmington and various other cities. On these trips he was accompanied by different members of the house committee on rivers and harbors. He has also visited New Orleans, St. Louis, Rock Island and Minneapolis, on the Mississippi river system; Kansas City on the Missouri; Chicago on the lakes; Pittsburg, and now Portsmouth, on the Ohio, and he has but just returned from a comprehensive tour of the Pacific coast, where, starting at Portland, Oregon, every point of importance from there to Los Angeles, Cal., was visited. At all points public meetings have been held and river and harbor improvements from a national standpoint discussed, the work of the organization over which he presides presented, and earnest forceful pleas made for both moral and financial support of the movement inaugurated by the National Rivers and Harbors Congress—a fifty-million-dollar annual river and harbor bill.

The result is that in the eight months that have elapsed since the formation of this executive committee, it has, starting from absolutely nothing, for there was no membership list begin with, extended the membership of the National Rivers and Harbors Congress into 31 states of the

union, and now has among its members some of the most prominent and prosperous commercial organizations in the United States.

The committee is bending its energies and using every dollar of revenue received to increase its membership and to educate the people of the country to the great good that will come, when our rivers and harbors are, by improvement, made equal to the present and constantly growing demands of our commerce.

That I, who have no official connection with the organization, can give to you such details of its work, is due first to the fact that Chairman Ransdell has been most kind in giving to me every opportunity to know the working details of his committee, and further to the fact that the secretary and treasurer of the executive committee of the National Rivers and Harbors Congress is also secretary of this association.

The next convention of the National Rivers and Harbors Congress will be held in Washington, D. C., Thursday and Friday, Dec. 6 and 7, 1906, at the Arlington hotel, and the executive committee is now preparing the announcements which will be sent to every commercial and manufacturing organization in the United States, and I can safely say that if work, hard work, and intelligent effort will avail, there will assemble in the city of Washington on those dates, the largest and most influential convention ever brought together, having for its purpose the improvement of our rivers and harbors.

Before this convention closes there should be appointed from this association the full twenty delegates to which we are entitled, and no man should receive the appointment unless he pledges himself to attend; and further, the representatives of every organization throughout the entire valley, here present, should go back to their constituents and impress upon them the necessity of being represented at the Washington convention, for in helping that convention of the National Rivers and Harbors Congress, to be a grand success, you are helping to improve the Ohio river as surely as your presence here is a help, and that it is you need from me no assurance.

DEEP WATERWAY CONVENTION.

On the 15th and 16th of next month (November) a convention will be held at St. Louis to advocate and develop a plan for a deep waterway from the lakes to the gulf. It is proposed to form a permanent organization to carry out such plan as may be

adopted, through congress, and to work with the river improvement and commercial organizations of the Ohio valley, the upper Mississippi, the Missouri and the lower Mississippi to secure regular and adequate appropriations by the government for the improvement of the inland waterways of the country.

This convention will be largely attended and its deliberations will be of undoubted interest.

I suggest that this association appoint a large delegation of strong and representative men to attend it.

UPPER MISSISSIPPI RIVER IMPROVEMENT ASSOCIATION.

This important body held its annual convention at Minneapolis on the 9th and 10th of the present month. It was largely attended, and good work was done to advance the improvement of the Upper Mississippi, and to thus open to the markets of the world the products of that great section of our country.

PUBLICITY.

During the past year more successful efforts have been made by the association than ever before to educate the people of the country to the importance of the improvements of the Ohio river. The association is to be congratulated upon the great work that has been done in this line.

PREPARING FOR IMPROVED RIVER.

Many important points were developed during the collection of statistics under the direction of the association. Attention is called to but one of the many interesting and valuable results that will follow when the Ohio is improved from Pittsburg to Cairo. Mr. J. W. Jones, chief of the engineering company bearing his name, made a report on the mineral resources of the section of country lying between the mouth of the Little Kanawha and the mouth of the Licking river, one paragraph of which reads as follows:

"The Alma-Portland Cement Co., of Philadelphia, with its plant at Wellston and mines at Oreton, Ohio, capitalized at \$3,000,000, secured a written contract with the Hocking Valley railroad, before the final organization of its company, to haul its product to Gallipolis at a fixed price per barrel; and a part of its original plan is the ownership of a line of steamboats to deliver the product to its own warehouses to be constructed at Pittsburg, Cincinnati, St. Louis, and New Orleans. The present plant has a capacity of 1,600 barrels per day, and the company contemplates the erection of two new plants of 3,000 barrels each, per day, to meet

the demands of its river trade, which will be established on the completion of the government's proposed improvement of the Ohio river."

MISCELLANEOUS.

The work of this association during all the years of its existence has been active, persistent, and without cessation. The results have been exceedingly gratifying to all who have been advised as to what has been done. No organization in the country of a similar character has accomplished as much. We have had to rely entirely on voluntary contributions to secure means wherewith to prosecute our work. While as a whole the people of the valley have supported the efforts of the association in its long and laborious work — many times conducted under great and seemingly insurmountable difficulties—I regret to say that a number of towns and sections have failed to respond, when called upon with reasonable requests to further the work in which they are vitally interested. Some of these towns and sections have been governed by the fact that the improvements nearby have been ordered; others, in the belief that the danger point has been passed and the river will be improved without their assistance. This statement is made in no spirit of fault-finding or criticism, but that justice may be done to those people who have always borne, cheerfully and with public spirit, the burden of the struggle in which we have been engaged.

The association is under renewed and lasting obligations to the newspapers of the valley for their invaluable services in its behalf.

During the past year the work of the officers of the association has been greater than during any year in the history of the organization. I hereby tender to them my thanks for the aid they have cheerfully given me at all times since the adjournment of the Cairo convention.

I am particularly indebted to J. F. Ellison, secretary, for the prompt and intelligent manner in which he has discharged the responsible duties of his position. His work was largely augmented by reason of securing and compiling statistics, as hereinbefore noted. Notwithstanding this, every duty has been efficiently performed.

The Moran Co., Seattle, Wash., laid the keel for the new steamer which they are to build for the Northwestern Steamship Co. last week. The \$18,155 repair job on the steamer Tampico has also been started.

ITEMS OF GENERAL INTEREST.

The annual convention of the Tennessee River Improvement Association was held at Sheffield, Ala., on Thursday of this week. President Thomas R. Roulhac, of Sheffield, presided.

At a recent meeting of the Merchants' & Miners' Transportation Co., at Baltimore, Mr. Joseph C. Whitney was elected president of the company, and Michael Jenkins, former president, was elected chairman of the board of directors.

Richard L. Walker has been appointed assistant to Vernon H. Brown, the general manager of the Cunard line in the United States. Mr. Walker succeeds Robert Floyd, who filled the place for nearly twenty years. Mr. Floyd retires from business.

The Electric Launch Co., Bayonne, N. J., is building four steam launches for the quartermaster general's department, United States army. The launch is 60 ft. over all, 10 ft. beam and 4 ft. draught. The hull is of oak, planking of yellow pine, and fastenings of copper and bronze.

It is reported that the three tugs and one lighter under construction at the yard of A. C. Brown & Sons, Tottenville, S. I., N. Y., were not in any way injured by the fire which recently occurred at this yard. The estimated damage is \$40,000, and is covered with insurance.

The naval board has recommended the expenditure of \$5,000,000 on improvements to the Brooklyn navy yard and suggests that additional district be purchased, the erection of a number of piers, several buildings, marine railways, storehouses, a 10-ton traveling crane and a general rearrangement of some of the existing buildings.

The Kelley-Spear Co., Bath, Me., recently launched the 250-ft. carfloat No. 9, built for the Bush Terminal Co., of New York. Work is being rushed toward completing the big carfloat, 260 ft. long, for the Erie railroad, and the first of six barges building for the Jay St. Terminal Co., of New York, is expected to be launched very shortly.

The Baltimore Steam Packet Co. has just awarded contract to the Maryland Steel Co., Sparrow's Point, Md., for the construction of a new passenger steamer to be a duplicate of their steamer Virginia. The new steamer will be 306 ft. long, 56 ft. beam and 18½ ft. deep, and is promised for delivery within a year. She will differ slightly from the Virginia in her upper works.

The Baltimore Steam Packet Co., commonly called the Old Bay Line, has given contract to the Maryland Steel Co., Sparrow's Point, Md., for the construction of a passenger and freight steamer to be 306 ft. long, 56 ft. beam

and 18½ ft. draught, and to be equipped with triple-expansion engines 22¼, 40 and 47 in. cylinder diameters with stroke of 42 in., supplied with steam from Scotch boilers 13 ft. diameter and 11 ft. 3 in. long.

Robert W. Hunt & Co., engineers, The Rookery, Chicago, have been appointed consulting, designing and constructing engineers for the new municipal electric lighting plant for the city of Milwaukee, by Mr. Chas. J. Poetsch, city engineer. This appointment has been unanimously confirmed by the city council, the site for the plant has been purchased, and work will immediately start upon plans and specifications. The estimated cost is \$700,000.

The new wrecking steamer Relief was launched from the ship yard of the Harlan & Hollingsworth Corporation, Wilmington, Del., recently. The vessel is for the Merritt & Chapman Derrick & Wrecking Co., of 17 Battery Place, New York, and is intended for their West Indies station. Miss Sallie Merritt, daughter of Mr. R. J. Merritt Jr., treasurer of the company, was the sponsor. The new vessel is 184 ft. in length between perpendiculars, 30-ft. beam, and 20 ft. depth of hold, fitted with a double bottom. She is a single-screw boat, having an engine with cylinders 20, 30 and 50 in. by 30-in. stroke, to which steam is supplied by two 13 x 13 Scotch boilers. The new vessel will be finished some time in January and will be sent to Kingston, Jamaica, at which point the Merritt-Chapman Co. established a wrecking station five years ago.

It was the original intention of the war department to have the new armored cruiser South Dakota, built by the Union Iron Works Co., at San Francisco, completed and ready to be placed in active commission about the first of January, 1907. However, subsequently it was determined by the war authorities to have the new cruiser completed as soon as practicable. Work, therefore has been crowded forward at the Union Iron Works, and the South Dakota is to all intents and purposes finished. The new cruiser has been lying for many months at the yard while work has been in progress, and the hull has become foul. The vessel has just been placed in the mammoth dry dock at Hunter's Point, the hull has been scraped and treated to two heavy coats of paint. By not later than Nov. 15 it is expected that this latest addition to the American navy will be in complete readiness to make her preliminary and endurance trial runs. She is a sister ship to the California, and will be required to make 22 knots per hour.

LAKE SHIP YARD METHODS OF STEEL SHIP CON- STRUCTION.

BY ROBERT CURR.

Fig. 94 shows the method of marking the outer spar-deck stringer plate. The inner edge of the plate EE is taken as a starting part of the laying off of the plate.

From the line EE the beam and butts

The mold G is used for marking the rivet holes on the continuous channel between the beams as well as the holes through stringer plate.

Fig. 97 shows the mold used for marking the intercostals and the clips for same are marked from mold, Fig. 24.

The shell flange of the stringer angle is marked with the mold A; it is moved a hole space so that the holes in the root will not come together. By this

as shown by Fig. 88 at the fore and after end of the deck plate mold. These coamings are 12-inch channels and are connected to the deck with rivets about 6 diameters apart.

There are always molds on hand with the different spacing of rivets, so that it is the practice to use a mold of the pitch desired on this class of work.

Fig. 40 shown and explained in an earlier issue is used for hole spacing.

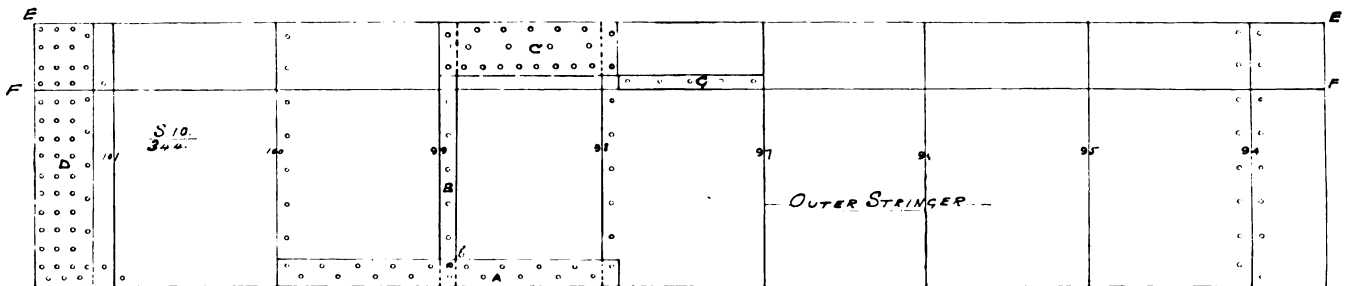


Fig. 94.

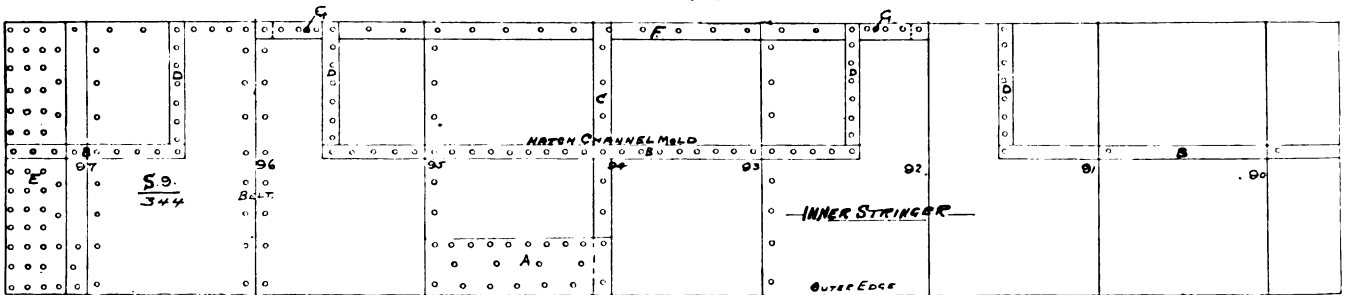


Fig. 95.

are squared in and the intercostal for girders and ship side are lined in parallel to EE.

The mold A is applied to the edge of the plate representing the ship's side, which is two frame spaces in length and the rivet holes are universally pitched so that the mold can be used throughout the straight part of the vessel.

In the butt spaces a change is made so that another mold is necessary there only.

The mold B shows the rivet holes for the connecting of the stringer to the beam. This mold is applied to the edge EE and as it is the width of the plate it determines the line at side.

The rivet hole pitch is made to suit the beam No. 99 and the rivet hole b is rubbed out on this beam and left in on 98 and 100 as shown on Fig. 94, this hole being put in to suit the stringer angle pitch of rivets. Mold C is for the inner edge of the stringer plate, a change being made at the butts as shown on Fig. 87.

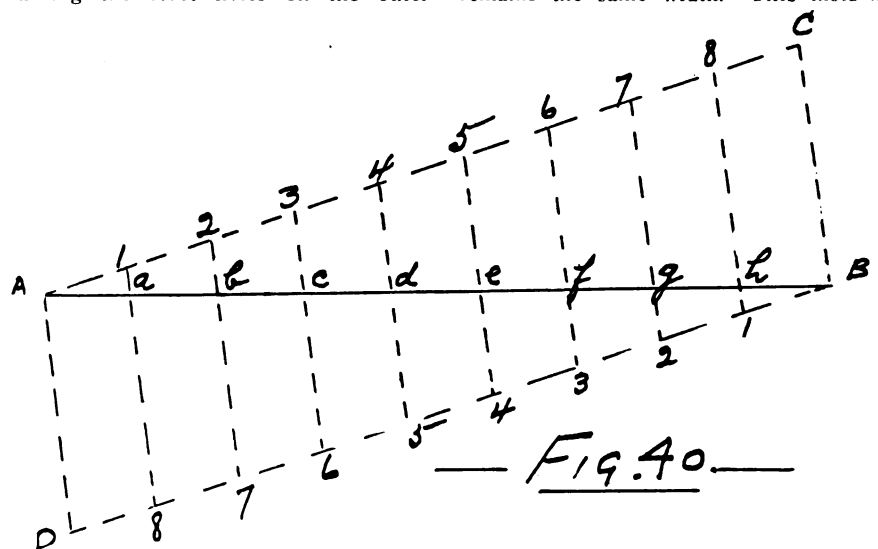
Mold D shows the butt riveting and is used throughout the ship where the plates remain the same width. G shows the mold for the intercostals and is applied to the heel of the beam as shown on Fig. 94. Fig. 93 shows the arrangement of the girder on the vessel which runs under the stringer plate as shown by FF Fig. 94.

arrangement the hole in the shell flange will be away from the heel, while the hole through the stringer plate will be near to same.

Fig. 95 shows the marking of the inner stringer. The mold A is used for marking the rivet holes on the outer

All molds of the different spacings of rivets are always on hand and very little time is lost in securing the proper pitch to suit any part of the vessel.

C shows the beam rivet mold and this is used on every beam where the plate remains the same width. This mold is



edge which butts on to the outer stringer. This edge is used for squaring the beam and butt lines 90 to 97, etc.

B shows the riveting for the hatch coamings in a fore and aft direction and D the holes across the vessel. Mold B is used for all the sides of the hatches and D which extends across the vessel

worked from the outer edge of the plate. Where belt frame beams come and have double angles this mold is turned over for the other flange.

E is the butt mold and is used all through where the plate remains the same width.

F shows the riveting of the edge of

stringer connecting the stringer and girder channels together. This mold is used for the rivet holes on the continuous channel under the beams, for the intercostal channel fitted between the belt frames Fig. 92.

Any mold with a universal pitch of rivets 8 diameters apart can be used for this work. When the mold F is used the hole G is put in instead of the two rivet holes at either side. For all clips used on Fig. 92 the mold, Fig. 24, is used.

The close pitch of holes between the hatch coamings DD are put in to suit the deck-plate Fig. 88, and are for watertight work.

The deck plating on this vessel is only a strip 3 feet wide as shown by Fig. 88.

Fig. 88 is a half of the deck space between the stringer plates and the whole space between the coamings. The mold is turned over after the holes in same are marked, the center line being the guide line for applying the mold to at the center. This half mold suits for marking all the deck plates between the hatches.

At the ends of the vessel, molds are made for one-half of the vessel. Each mold represents two plates.

The holes are all punched for deck fittings and where mooring chocks and cleats come on the stringer angle the holes are arranged from molds to suit same.

Fig. 99 shows hatch corner arrangement. The channel running across the ship fits in between the channels running fore and aft. The fore and aft channels are cut the shape of the athwart channels at both ends as shown by sketch.

COMMENDATION OF THE EADS.

Editor MARINE REVIEW.—A feature that is well worth mentioning is the steamer James B. Eads which came up in the recent gale on Lake Superior. She is considered one of the best towing steamers on the lakes. While towing a barge it is known, she passed several lone steamers, among them were the James Laughlin and W. P. Snyder. Chas. Fletcher, of Cleveland, who is chief engineer, has Roy Turner and J. Shannon oiling for him. They both fitted out the boat and are well prepared to stand an examination for engineers' license as soon as their boat is laid up. Wm. Braun, who is wheelsman on the Eads, is one of the boys who fit out a boat and lay her up. He is also prepared to try for second mate's license this fall. Harry Sadecker, who is on deck watch is learning to be able bodied seaman under the instructions of Carl Mattson, who has

been watching on the lakes for the past fifteen years. W. Millikin and F. Hunt are first and second mates, Paul Bremo is cook. The Eads unloaded at the P. Y. & A. dock, Ashtabula.

CAPT. WALTER J. MAHAN.

Capt. Walter J. Mahan, master of the steamer Tom Adams, is known as the "Newsboy Tenor of the Lakes." He originally hailed from Malden, Mich., but he later moved to Cleveland where he and his wife reside. Many touching and extremely pathetic instances are related of the generous



CAPT. WALTER J. MAHAN.

use Capt. Walter makes of his voice, but the best is where he volunteered to comfort a poor little newsboy who had not many days to live. Capt. Walter sang to the little lad daily till the tiny spirit departed to his Maker. The memory of this kindly act has clung to him.

JAMESTOWN EXPOSITION.

One of the most spectacular features of the Jamestown Ter-Centennial Exposition, to be held on the shores of Hampton Roads near Norfolk, in 1907, will be the grand military display. Here will be assembled in martial array, not only the military organizations and government troops of this country, but soldiers from all of the representative nations of the world, who will be encamped on the grounds of the exposition for stated periods and will be the nation's guests while in this country. An entire division of United States soldiers will be quartered at the ter-centennial to act as military hosts for the foreign troops. Among the famous organiza-

tions that will be represented are the Ancient and Honorable Companies of Artillery of London and Boston, the oldest military organizations of their respective countries. Another company that will arouse great interest at the exposition will be the "Armed Confederate Veterans of Tennessee" that will come three hundred strong, armed with the old muzzle loaders and uniformed in the confederate gray. These old soldiers from Tennessee encamped in the midst of an array of the very best equipment will afford a most interesting and instructive opportunity for comparison with the warfare of those times and that of the present day.

Officials of the exposition, realizing the necessity for space required to drill and maneuver such a vast body of men, have set aside thirty acres of land in a central location, to be known as "Lee's Parade." This will be the largest and most beautiful ground of its kind ever allotted for the purpose at any of the previous expositions. Another feature of the military display will be the many bands and musical organizations that will accompany their regiments to the ter-centennial. The musical program will be both beautiful and varied and the Jamestown exposition will be a continuous and varying scene of martial splendor from beginning to end, such as has never been witnessed in this or any other country.

CALIFORNIA SHIPPING CO.

The California Shipping Co., at its annual meeting very recently held in San Francisco, received the most encouraging reports of the year's business since its organization six years ago. The company organized with a capital stock of \$1,000,000. It had then twenty-one vessels. Six have been lost since, and the business was not very profitable. During the year just past, with only fifteen vessels employed in the coastwise trade, the net earnings of the company amount to \$60,000, and its vessels are engaged at profitable rates. The following officers were elected for the ensuing year: President, Cyrus Ryder; vice president, Charles Baudron; secretary, William Babcock; treasurer, the Mercantile Trust Co.; directors, Capt. W. J. Gray and E. E. Kentfield.

James J. Rohan, who sailed the lakes for seventeen years, has remodeled and added to the LaMar house at Fairport, intending to open it next spring for the marine trade. His heat and light are supplied from his own gas well.

AROUND THE GREAT LAKES.

The little schooner Margaret Dall was blown on the beach at South Manitou and is in bad condition.

The steamer James S. Dunham arrived at Duluth on her maiden trip last week and took her first cargo from the Missabe dock.

It is reported that the Cargill Commission Co., of Minneapolis, will erect a large steel grain elevator at Rice's point next spring.

The residents of Sand Beach are preparing a celebration for the return

down for the season, it is expected that Junior Engineer Geo. Phelps will return to the United States engineer's Cleveland office from Ashtabula harbor.

The steamer P. A. B. Widener, the fourth and last of the 600-footers building for the Pittsburg Steamship Co., went into commission last week. She was built at the South Chicago yard of the American Ship Building Co.

The wrecking tug Favorite has been ordered to the Canadian steamer

Dan McGillivray, mate on the steamer Samuel F. B. Morse, was called from his boat at Ashtabula Friday to assist Capt. W. W. Smith in wrecking operations on the barge I. L. Bell, sunk in the St. Clair rapids. He was succeeded by E. F. Bernard, mate of the James B. Colgate.

P. H. Cheney Sons, Ashtabula, are altering their store to accommodate the postal telegraph and the U. S. customs offices. George Doremus, the man who lathed the building in '76, put new laths on this time. The alterations will increase the number of marine offices in the building.

Ashtabula harbor's docks are in bad shape along the east side of the river and there appears to be no move on to fix them. There is grave danger that someone will meet with a serious accident walking on them, but it looks as though a fatality is all that will bring about an improvement.

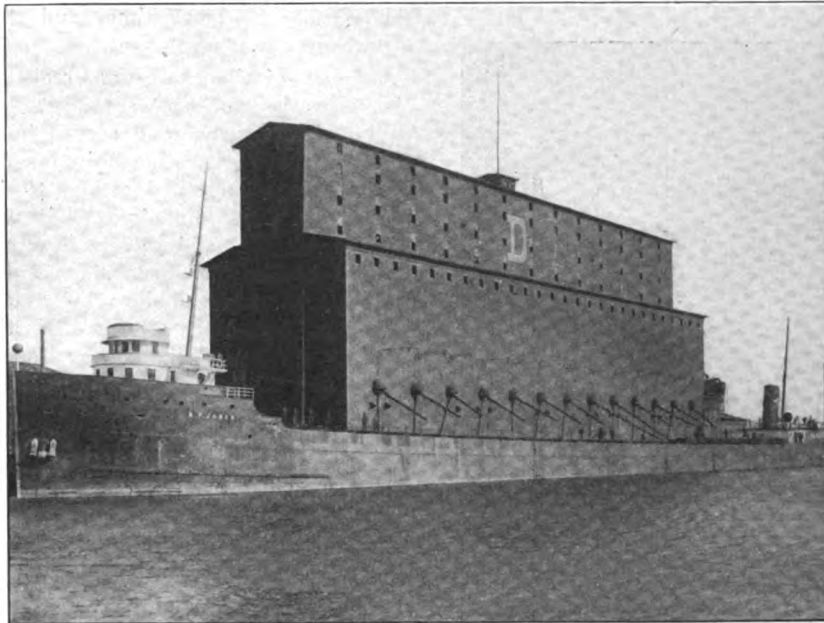
Extensive improvements are contemplated on the docks of the Pittsburg & Conneaut Dock Co. at Conneaut, O., during the winter. The largest piece of work will be the erection of a big electric conveyor on dock No. 4, similar to the one now in use, to carry ore back from the stock piles.

Maj. C. McD. Townsend, United States engineer, says that with the appropriations allowed for government work in Cleveland harbor by the season of 1908 Cleveland will have a magnificent outer harbor which will have cost more than \$5,000,000 and be the finest on the lakes. The breakwater will be extended to 7,000 ft. This harbor will be used mainly for shelter.

The abandonment of the steamer Lackawanna which went on the submerged breakwater crib off Cleveland harbor has been withdrawn by the owners. The Lackawanna is now in the No. 3 dry dock at Cleveland and repairs upon her will not reach one-half her insured value. The Lackawanna is owned by John J. McWilliams, of Buffalo, and was under charter of the Mutual Transit Co.

Charles Webster, who hails from Owen Sound during the winter and acts as a wheelsman during the season of navigation is heralded among his personal friends and acquaintances as the crack shot of his part of the country. There is plenty of wild game where he lives, and his opportunities for practicing up are unlimited. Mr. Webster has been wheeling on the big steamer B. F. Jones all season.

Gov. Warner has appointed a number of delegates from the state to the



The steamer B. F. Jones loading her great cargo of 370,373 bu. In unloading the cargo, she commenced elevating at 7 o'clock Monday morning at the Mutual elevator and at 4 o'clock had discharged 227,000 bu. She then went to the Niagara elevator, commenced work at 7 o'clock Tuesday morning and at 9 o'clock Tuesday night had discharged 143,000, finishing her cargo of 370,373 bu. in 22 hours working time.

of Captain Fabian Cody, master of the steamer Zimmerman.

A revised chart in colors of Coast Chart No. 6, Lake Erie, has just been issued by the United States lake survey and is now for sale by the MARINE REVIEW.

Mr. James M. Smith, manager of the Collingwood Ship Building Co., Collingwood, announces that his company has sufficient work to keep it busy until next June.

Ralph Sullivan, assistant superintendent of construction of the Pittsburg Steamship Co., has resigned to engage in the insurance business. He is a son of Capt. Dennis Sullivan of Chicago.

The American Passenger Lines Association will meet in New York this week, beginning Thursday. Lake interests will be represented by A. A. Schantz, Walter Campbell and B. W. Parker.

Just as soon as the Gillen Dock, Dredging and Construction Co. closes

Winona, on Graham shoal below the north end of Great Buck island, Lake Huron. The Winona is loaded with cement and her No. 1 compartment is full of water.

Mr. James Russel, secretary of the Great Lakes Engineering Works, announces that the new steamer building at their yard for C. W. Elphicke, of Chicago, will be named in honor of John Mitchell, the well-known Cleveland vesselman.

Edgar C. Bowen, assistant Lake Shore engineer on the Ashtabula improvements, is making rapid progress in the work ahead of him. The east side of the big fill has a good start, and the south end is being pushed. A trestle for cars is run both ways.

While going into the Missabe docks at Duluth to load ore, the steamer James E. Davidson collided with a southerly abutment of the Minnesota draw of the Northern Pacific bridge, dislodging it and toppling the rafting span south of the draw into the water.

National Rivers and Harbors Congress in Washington, Dec. 6 and 7. The Detroit men named are: Capt. Wm. J. Crosby, C. F. Bielman, Antonio Pessano, Wm. Livingstone, Andrew H. Green Jr., Alfred Lucking, Wm. C. Maybury, George Morley, Henry C. Barter, John R. Russel, Capt. George Lockerbie, Wm. C. McMillan, Russell A. Alger and Edwin Denby.

Handling the throttle comes natural to the Ward and McCabe families. John Ward is chief engineer of the M. A. Hanna; Tom is chief of the Jesse Spalding; Anthony is chief of the Wisconsin and Hiram is second on the Umbria. All four are brothers. Patrick McCabe, father of Barney, Owen and Tom McCabe, is chief on the Bixby, while Barney and Owen are chief and second on the Admiral and Tom is chief of the Tom Adams.

The Canadian steamer Theano struck a rock four miles east of Thunder cape, Lake Superior, this week and is reported to be totally wrecked. The Theano was trying to reach shelter and struck the rock bow on, north of the entrance to Thunder bay. She then swung against the rock and crushed in her sides, sinking in a few minutes. The crew escaped in small boats. The Theano was built at Rotterdam and was owned by the Algoma Central Steamship Co.

Appeals are to be taken to the supreme court at Ottawa from a couple of judgments recently given by Judge Hodgins of the admiralty at Toronto. He assessed the steamer C. F. Bielman \$4,161.75 for running down, in the St. Clair river, the sand-sucker Burroughs, owned in Windsor, Ont. The D. C. Whitney was assessed \$3,860 for colliding with the schooner Monguagon in Lake Erie. Both boats are appealing. The boats are American, but were arrested in Canadian waters.

According to indications at Buffalo, and other ports for that matter, the lake seamen's union for several weeks back has cut off the intelligent element among the young deckhands on the lake freighters in their attempt to get out their blue books. The MARINE REVIEW representative has personal knowledge of two instances where young men were told they could not have their books because the union was not giving out any more. As a matter of fact, others went up right after they did and got their books.

The steamer Strathmore, formerly the old package freighter Gordon Campbell, was wrecked on Michipicoten island last week. The Strathmore struck the rocks off the northwest point of the island during a

heavy gale. The steamer was a quarter of a mile from shore and began to sink despite the efforts of the crew at the pumps. After the fires had been put out under the boilers, Capt. Patrick Sullivan ordered the crew to the lifeboats and succeeded in reaching shore. The steamer was built in 1871 for the Anchor line.

After Jan. 15, according to an announcement made by Capt. J. J. H. Brown, of Brown & Co., of Buffalo, the marine men who drift into his office will be able to look out over Lake Erie's broad expanse without shifting. Brown & Co. will move from the Dun building to the Chamber of Commerce, taking the suite on the twelfth floor on the Swan street side. There is a balcony running along the rooms where visitors may also have a chance to inhale the Lake Erie ozone. One of the changes brought about by the move will be a larger working room.

As the wooden steamer James Fisk Jr. bound up light from Buffalo, was passing through the St. Clair Flats, fire was discovered in the forward part of the boat. Capt. Alex Clifford and the crew could not check the flames, and finally the steamer was beached on the American side below Muir's landing, and the crew came safely ashore in a small boat. The Fisk is owned by Alvin Peter, of Toledo, and was operated in the lumber trade between Georgian bay and Lake Erie ports. The Fisk was built at Buffalo in 1870, and is 213 ft. on the keel and 32 ft. beam. It was rebuilt in 1901.

Charles Dhyse, who was oiling on the steamer W. S. Mack, was instantly killed at South Chicago, Nov. 3 in a most remarkable manner. His two sisters visited him on the morning of that day a short time before the boat went out. They returned and agreed to wave to him from the 92nd street bridge. He stuck his head out the deadlight to call to them and as he did so some spring piling between the bridge abutment and the boat caught him and cut the top of his head off. He fell back in the engine room. The accident happened so quickly, T. J. Blain, chief engineer, did not know it 'till he happened to look under the cylinders to the port side of the boat.

Capt. George B. Mallory, shore captain for Pickands, Mather & Co., went to the steamer Pathfinder when she was ashore near White Rock, Lake Huron. He has returned thoroughly convinced that all life saving stations on the great lakes should be equipped with power boats. He said that the wreckers and members of the crew had to abandon

the steamer during a northeast gale and that it would have been impossible for them to have left the stranded vessel if the life savers at Harbor Beach had not been equipped with a power boat. The ten-mile run to the beach could not have been made in an ordinary life boat.

Tonawanda reports the lumber shipments via Erie canal during October were 18,438,074 ft.; stone, 6,720,000 lbs.; merchandise, 100,000 lbs. The lumber shipments of October exceeded those of the same period last year by 3,000,000 ft. All the October merchandise shipments from the Tonawandas were for Buffalo and the lumber and stone shipments went to points between Rochester and New York. The lumber receipts at Tonawanda during October were 61,338,362 ft., an increase of 5,900,000 ft. over last year. The fall rush of lumber to the Tonawandas has begun. A number of the ore carriers have been pressed into the lumber trade.

The steamer State of Ohio, which stranded on Rattlesnake reef, Lake Erie, has been taken to Detroit for a complete survey, and will be repaired in the dry dock at Detroit. The preliminary survey at Toledo showed that forty plates would have to come off her bottom and that a portion of her deck would have to be renewed, necessitating the tearing down of a portion of the deck houses and the removal of her engines. The steamer is not as severely injured as was at first supposed and the Cleveland & Toledo line have withdrawn their abandonment of her. The detailed survey of her at Detroit will be conducted by Mr. R. Parry Jones, on behalf of the underwriters, and by Mr. Frank E. Kirby, on behalf of the owners.

Col. E. C. L. B. Davis announces a change in the Elliott point range in the lower Detroit river to mark the center line of the improved 600-ft. channel at the Lime Kiln crossing, between Bois Blanc island and Amherstburg, from the Amherstburg Canadian range to the head of Bois Blanc island Canadian range. Following is the new range: Front tower on east bank of Detroit river, 1,880 ft. south 46 degrees 20 minutes 30 seconds east from Bois Blanc (Canadian) lighthouse; white, pyramidal, skeleton, metal tower with white horizontal slats at top; fixed red light 50 ft. above water surface. Rear tower, 1,060 ft. south four degrees, 12 minutes 30 seconds east from the preceding; white, pyramidal, skeleton, metal tower with white horizontal slats at top; fixed red light 70 ft. above water surface.



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November 22, 1906.

WHEN WILL THE HOUSE ACT?

The shipping bill lies in the house merchant marine and fisheries committee, to which it was referred a year ago, at the opening of the first session of the 59th congress. In the same committee lies the same bill, amended, as it passed the senate on Feb. 14, 1906. The house committee two years ago favorably reported what was practically the same bill, when first formulated by the congressional merchant marine commission that had the year previous been appointed at President Roosevelt's request. Here is something not to be forgotten, and at all times to be remembered, in this connection: IF ALL OF THE REPUBLICANS ON THE PRESENT HOUSE COMMITTEE WHO VOTED TO FAVORABLY REPORT THIS BILL

WHEN BEFORE THE SAME COMMITTEE IN THE 58TH CONGRESS SHOULD NOW VOTE TO FAVORABLY REPORT IT, IT WOULD COME OUT. The interesting question is, why do not those republicans now on the committee vote as they did when on the committee two years ago? What are the influences holding them back? These have never been satisfactorily explained.

Republicans, in their national platforms, have for many years quadrennially pledged themselves to enact legislation for the building up of our shipping in the foreign trade. The people have time after time approved of these platform pledges by electing republicans to the control of the congress, so as to enable them to carry out their pre-election pledges. The republicans have miserably failed to redeem their pledges in respect to American shipping. In the present congress republicans have a majority of 112. In the present house merchant marine and fisheries committee there are 12 republicans and but six democrats. One democrat is known to favor the merchant marine commission's shipping bill. When the bill is reported out, and that favorably, the vote should stand 13 for to 5 against. Why, then, all this dilly dallying? There should be a majority of more than two to one in the house committee. Why then is the bill not favorably reported?

The time for plain speaking has come. It is up to the house republicans to redeem republican pledges. What holds them back? A majority of the members that framed the bill were republicans—senators and representatives in the present congress. It is the only bill that republicans have offered in congress by which to redeem republican pledges in behalf of American shipping. Is the bill unsatisfactory to republicans in the house and in the house committee? If it is, why do they not offer a bill that they regard as satisfactory, in order that they may try to redeem their ante-election pledges? But if republicans in the house committee, who two years ago voted to favorably report

this shipping bill, now find it unsatisfactory, how can they explain their votes in its favor two years ago? Now, these are reasonable questions—they are questions that the friends of American shipping, that the advocates of this bill, have a perfect right to ask. They are asking it, and they are pressing, earnestly, seriously, persistently, for an answer. The most satisfactory answer they can receive will be to have the bill reported immediately upon the reassembling of the 59th congress, next week. Still more satisfactory would be its immediate passage by the house. In good faith, this is what republicans should do. The time for dilly dallying has passed. The time for action has arrived.

Remember: The senate has passed the bill.

Remember: The president favors the bill.

Remember: A majority of the members of the present house committee in which the bill now lies favorably reported it out two years ago.

Remember: Republicans are pledged to enact a shipping bill.

Remember: But one republican shipping bill is now before congress—the one passed by the senate, the one the president favors, the one the house should pass.

When will the house pass the shipping bill?

WHY WE ARE A DEBTOR NATION.

Sending \$200,000,000 in gold, or its equivalent, every year out of the United States, to pay foreign ships for carrying 90 per cent of our freight, passengers and mails, helps keep this country a debtor nation. We are told that the value of our exports, as officially stated, is the home selling prices of articles sent abroad. In a number of cases these sales do not yield the exporter what similar products bring in the home market. If it also be true that the value of our imports is fixed at their foreign selling price, less the average duty of 45 per cent on dutiable imports, it is obvious that their cost to consumers is much in excess of that official valuation. While, there-

fore, these considerations indicate that the seeming "favorable" balance of trade is not nearly so large as official statistics indicate—from four to six hundred millions annually—still other considerations tend to wipe out the entire amount of this so-called favorable balance, and change it into an unfavorable balance. These include the amounts paid foreign holders of our railroad and industrial stocks and bonds, the amounts spent abroad by American travelers, said to exceed a hundred millions annually, and the large sums sent by our citizens of foreign birth to their relatives in older countries.

These matters serve to explain why this country is so large a borrower in foreign markets. This also explains how it is when our periodical financial stringencies occur that we experience such difficulty in securing needed relief to tide us over seeding and harvesting periods. These stringencies, with their corollaries of high rates of interest, inevitably restrict the natural development of our boundless resources, and the natural expansion of our domestic and foreign trade, as well as leaving us dependent upon other nations—our commercial rivals—for the means with which to keep things running regularly and smoothly. The screws are put to us all the harder because we are a debtor nation, and we are compelled to roundly "pay the piper." Thus our remaining a debtor nation enables our commercial rivals to check our development and expansion, to their advantage and to our loss.

Financiers should give the matter of our \$200,000,000-a-year payments to foreign ships more consideration. They should, more unitedly and more insistently, demand that our dependence upon foreign shipping for the carriage of 90 per cent of our imports and exports should end. They should realize that this condition is due to the free trade competition to which our unprotected American ships are subjected in the foreign trade. They should know, and they should say, and they should keep on saying, that our foreign-going ships are entitled to precisely the same protection that our tariff affords to our products on the land that are subject to foreign com-

petition—an average of 45 per cent. Not half this amount of protection would be needed to give our entire foreign carrying to our own ships.

To supersede the foreign ships now doing our foreign carrying with American-built ships would involve an expenditure of approximately \$750,000,000, distributed all over the country, because in ship building "all trades are united." Thereafter we should keep in our own country, in our own channels of trade, the \$200,000,000 now annually paid in freight charges to foreign ship owners. This one consummation, if sustained, would change the United States from a debtor to a creditor nation. Then we should have a free field for the development of our vast resources and the expansion of our industries and our trade, domestic and foreign. Why, therefore, every financier of influence, and every financial journal of influence, impressed as they must all be with the restrictive influences due to our being a debtor nation, are not united and insistent in behalf of such legislation as will give and make permanent a great and prosperous American merchant marine, is utterly beyond our comprehension.

FREIGHT SITUATION.

Heavy weather has naturally interfered with the movement of vessels during the past week. Lake Superior has been visited with storms of more or less violence and loading at upper lake ports has been extremely slow. Quite a number of carriers that in the order of things should have left at the close of the week were held over Sunday. As some of these ore carriers have promised to take grain on their last trip, this delay is extremely inconvenient as it practically cuts them out of the trip. The barges are being steadily retired and probably by the end of the week the ore movement will be confined to steamers exclusively. While the movement of ore for the first half of November has been heavy, weather conditions are operating to greatly diminish the movement during the last two weeks of November. So completely is the business dominated by the contract system that there is absolutely no change to be noted in rates. Receipts of coal, owing to scarcity of cars, continue light at Lake Erie ports.

The grain receipts and receipts for the week ending Nov. 17, were as follows:

	Receipts.		Shipments.	
	Nov. 17.	Nov. 10.	Nov. 17.	Nov. 10.
Wheat	2,248,985	2,232,220	1,241,260	2,271,320
Corn	3,769	21,459
Oats	128,197	114,927	8,650	129,230
Barley	514,580	554,254	468,171	408,043
Rye	33,858	37,974	1,034
Flax	1,254,109	1,264,054	633,625	804,711

MICELLANEOUS ITEMS.

The Palm Beach Power Boat Association will hold its third annual speed carnival and parade on Lake Worth, Palm Beach, Fla., from Jan. 29 to Feb. 1.

Mr. A. P. Lundin, 7 Whitehall street, New York, is manager of the Welin quadrant davit, a demonstration of the efficiency of which has recently been made on the great lakes.

Repairs involving an expenditure of \$1,172 will be made on the lighthouse tender Iris by the Burlee Dry Dock Co., Port Richmond, S. I., N. Y. This was the only bid received by the third lighthouse district for the work.

Mr. Robert Jacob, of City Island, has, in course of construction, a new high-speed steam yacht which was designed by Messrs. Swasey, Raymond & Page, of Boston, Mass. Steam will be furnished for the Sullivan engine by one No. 15 Roberts safety water-tube boiler.

At the meeting of the board of directors of the navy league of the United States, held on Nov. 13, the following officers were elected: President, General Horace Porter; vice president, William McAdoo; treasurer, Clinton E. Braine; secretary, Robert S. Sloan; assistant secretary, George H. Owen, and general counsel, Herbert L. Satterlee.

The international jury of the Milan exposition has just announced the award of a diploma d'Onore to the Long Arm system of electrically operated bulkhead doors. The award takes higher rank than the gold medal granted by the jury in some cases. The "Long Arm" System Co., of Cleveland, Ohio, had an elaborate installation of its watertight doors at the exposition, and so much attention was attracted by the exhibit as to give rise to a demand upon the government to make the installation of electrically operated bulkhead doors on large passenger ships obligatory. Some time ago the "Long Arm" system passed the severe tests put upon it by the United States navy department, and the electrical doors and hatches of this system are now in use upon most of the new American warships. From a central emergency station above deck, all the principal bulkhead doors can be closed in a few minutes. The great advantage gained is that the electrical control makes closure of the doors possible under all circumstances, even in the event of a hull puncture below the water line, or when the conditions would make it impracticable to close bulkhead doors by hand against inrushing water.

OLD-TIME CONDITIONS AFLOAT.

At the semi-annual dinner given by the Traffic club of Pittsburg, Capt. Charles W. Brown made a very interesting speech in which he contrasted old-time conditions afloat with present-day conditions. His account of the early achievement of clipper ships was extremely interesting. Among other things he said:

"You will remember during the Spanish war when the Oregon made that famous trip from San Francisco to Jupiter inlet, Florida, in sixty-eight days that we all felt so proud of as Americans. We felt proud of our men, we felt proud of our vessel, we felt proud of our designers and the papers heralded that remarkable achievement from one end of the land to the other. I think there are perhaps very few gentlemen present who know that in 1853 the old clipper ship Tradewind sailed from San Francisco to New York, which is two or three days further than Florida, in 75 days or within seven days of the time of the famous Oregon record trip. In the days of those old clipper ships, gentlemen, we can feel proud of our American transportation. We led the world and fifty years ago our foreign commerce in vessels sailed under the American flag, owned by Americans, built and designed by Americans and made by Americans was of more importance than the railway interests. The famous clipper ship, Dreadnaught, in 1856 beat the Cunard steamer a day across the Atlantic and it was only in the '80's that the time in 24 hours made by that old clipper ship was ever beaten by any modern steamer. While there was not capital invested in a single vessel in any way that would compare with the modern corporations in railroads, the net returns to the stockholders and owners were in those days very much greater than at the present. One of the famous old ships, the Surprise, sailed from New York to San Francisco and to Canton and then to London and in about ten months sent money enough home from London to pay the original cost of the vessel, all the expenses of the trip and \$50,000 additional dividend.

"It is unnecessary here to attempt to explain the cause which destroyed the American mercantile marine. I do not wish to give you the impression that I date back to 1850. My seafaring days were long after that, but I wish again—I forgot to make the point at the right time—but I wish again to call your attention to that remarkable fact of the sailing from San Francisco to New York in

75 days. That meant much more individual effort on the part of the skipper of that ship than is necessary on the part of the captain of the Oregon. It is not the purpose to deprecate the achievement of the Oregon but to have sailed a vessel that distance at nearly the same rate of speed as the modern steamer, that a man is up day and night and is taking the risk of carrying away his mast out of his vessel and he is obliged to hug the shore, when he couldn't keep track of how fast he is going by the revolutions of the engine, when there was no such thing as a patent log and when it made the difference of a day's time how close to the big rocks at the southern end of Cape Horn he could go. And there is another thing in connection with that episode. There were no vessels afloat at that time which could compete with our own American ships. There was probably no other vessel at that time that could make within twenty days of the time to Australia that was developed by the American vessels and it was essential that England should have fast vessels in order to compete with American clippers and after the English ship builders had tried to build vessels to compete in the Chinese and Indian trade England sent over and bought several of our large American clipper ships and had them built for them here and I want to say that the record passages made between England and Australia were made by the old American built clipper ships.

"After the war and later owing to the opening of the Suez canal and the wonderful increase in steam applications there was a change in ocean transportation and it was impossible for sailing vessels to keep up with the development, notwithstanding all our American ship builders tried for a good many years to compete and the only way Americans could do that was by giving their captains a much larger scope and greater authority than the foreigners, whether English or Norwegian, and in the seventies and eighties the Norwegians and Italians became active competitors for the carrying trade of the world. But those vessels for nearly all charters went out to San Francisco and came back to New York and people had no discussion and the only way the sailing vessels could make some money in the seventies or eighties was by being ready to take advantage of any unusual opportunities which might appear to take freight from any part of the world. Three-fourths of the vessels would start out leaving the eastern

ports, New York, Boston, Philadelphia, almost always they started for Australia or China and the vessels which were previously engaged on the dead weight capacity basis—they were paid so much a ton of 2,000 pounds or under the English charter 2,240 pounds, but where they carry a large portion of light weight you would be engaged by the ton of 40 cubic feet and then later on it became more customary to make what was called a lump sum charter, that is, in the Australian or Chinese trade they would engage a vessel of known capacity and pay so much a round sum and take the chances of making a profit on the freight the vessel could take. As far back as the fifties the old American clipper ships received as high as \$60 a ton for taking tea from Canton to London which is the highest rate ever paid. I think the steamers today take that same tea cargo for six or eight or ten dollars, so you can see the great lessening of profit. The ordinary Australian cargo would be lumber and agricultural implements, patent medicines, tobacco, etc. After the vessel arrived at Australia it was then a practical problem in freight transportation to decide where the captain would go next and often necessitated a man of shrewdness to make the right kind of returns to the owner to decide from his knowledge of the condition of the hemp crops in the Philippines or the coffee crops in Java or the grain crops in California and in the meantime to get the good tea freight from China and those old sea captains in those days were well posted in the practical freight traffic as far as related to what it was advantageous for them to get in almost any part of the world at any given time. Leaving Australia it was quite common to take coal up to Hong Kong or Malay or any of the eastern points. Coal was a commodity that could always be sold and whenever a vessel could not get an advantageous charter it was quite common to buy coal and go to some port centrally located where they could be on the route south of the trade winds or monsoon and go after freight from Singapore or Hong Kong to New York. It was always advantageous as you gentlemen know in a practical way at present for a sailing vessel or steamer to come back to the Atlantic coast in ballast or they would accept any freight if they could get six or eight shillings a ton for carrying it because the money is made on the outgoing trip. Freight is cheaper from outside to the Atlantic coast than they would be to the English business be-

cause when the vessel arrives at any port on the continent they have to take a very low foreign charter or come across in ballast.

"Now there are some few customs connected with those old seagoing days which have gone out and there are very few men perhaps today capable of explaining them. The people of Pennsylvania owing to their natural resources have never been interested in foreign commerce to the same extent as the people along New England and New York coasts, or on the Pacific coast, or, strange to say, in the west there is a sentiment about our shipping which I have never found in Pennsylvania. Morgan Robertson, in one of his recent novels gives an incident of how an English admiral was shanghaied on board a foreign vessel at San Francisco. Some of you gentlemen may have read it. The shanghaiing process is now practically obsolete but it was quite commonly referred to and it was in operation only where wages were very high. Come to a place like San Francisco or British Columbia or Shanghai or Australia and it is almost impossible to get men in those days and in those days they were obliged to get men to carry their freight. Where you could not ship men in a regular way it is customary to employ the boarding house runner so-called, and pay him blood money for getting these men, if they would ship a man for fifty dollars a month he would sail away and they would pay the boarding house runner fifty dollars for getting that man. Of course, they wanted to get able seamen if they could, but they had to have some one and they were willing to get servants of any kind and hence it was quite a common custom for those boarding house runners to pick up anybody they could on the streets, get them drunk and in some cases drug them and take them on board the ship. The captains or mates could not be particular because they needed men and they would go to the consul's office in the afternoon and these men would sign the articles to make a certain voyage from San Francisco to any other port such as the master might elect. The men who were real sailors would be all ready to go but these boarding house runners would always have six or eight or ten men. And if they shipped them they would get an order for three months' pay in advance payable three days after the vessel sailed, and that is where the boarding house runners got their graft. It was a humble graft but it was the best they could do and then along at night they would

come and bring these fellows on board and the mate would call out as they came over the gangway John Johnson, Bill Brown, Tom Smith, etc., and the boarding house runner would answer yes. As long as the mate saw that the proper number of men was on board ship it was not his province and he didn't care very much who they were or what they were. Only there were well authenticated cases in San Francisco particularly where the boarding house runners had taken two or three policemen and made them drunk and put them on board and they could not put them off when they were outside of San Francisco.

"I have often been asked the question why it was that where respectable men had been shanghaied why they could not get redress. You can readily see in a case of shanghaiing on board a ship in San Francisco and it would be four months until he was landed in East Liverpool, and then by the time he got back to San Francisco it would be hard picking to find the boarding house runner that put him on that vessel and after the man got on the vessel there was nothing to do but submit. Often these fellows would not work. They would say to him, 'Johnson, go to work.' He would say, 'My name is not Johnson.' He would answer, 'Do you call me a liar,' and immediately the captain comes up on deck and asks what is the trouble and the mate says this is a case of insubordination. He calls me a liar. The captain says to him, 'Are you Johnson?' He says, 'No, I am Smith.' Then the captain says, 'What in hell are you here on board for? That you see is a very hard practical question to ask, because if he does not accept the inevitable and ship by whatever name they choose to give him he is a stowaway and of course as a stowaway by maritime law the captain can do anything with him he wants to and can make him work without any pay, so if he is sensible he goes to work and becomes a sailor the best way he can. I know at one time a German baron was shanghaied and also a Catholic priest at one time. He came down town and got a little drunk and was drugged and the first thing he knew he was sailing off to London and had absolutely no redress.

"This, of course, has no direct bearing on traffic only being obliged to speak to you I chose a subject that I knew something about. There is one other story of the sea which, as far as I know, has not been in print. I think you gentlemen in crossing the

water have often noticed those little black web-footed birds following the vessel and you probably know that they are called Mother Carey's chickens and that the sailors always feed them and never harm them. That is quite an old sailor superstition and very common. You may not know that the sailors believe that these Mother Carey's chickens are the souls of lost sailors. It is quite an old sailor superstition, very common, but I don't think that is generally known. In the old days they very frequently met icebergs in crossing the Atlantic and one time one of these ships struck an iceberg and immediately sank and everybody was drowned and the sailors, so the legend goes, were all very promptly consigned to the low regions. After they came to and began to look around and get a little acquainted they began to growl, as sailors all do. They growled vigorously. They didn't like the climate and they said the grub was no good and they couldn't get any grub worth eating and they fought among themselves, so the yarn goes, their invectives shocked the people who were down there. There were a good many peo- down there that were actually shocked at the stories these sailors told. Finally Satan got pretty well discouraged and he interviewed St. Peter and told him that he was not going to take any more sailors. He said they tired the life out of him, that he had run a good institution and got along very nicely for a good many years, but that as for taking sailors any more he would not do it. St. Peter told him that he had enlisted for the whole campaign and he would have to go on with his business and finish it out. Well, Satan went down there a second time and began to listen to some of the yarns which the sailors were telling. Hell wasn't as hot as the Red Sea in the summer season. Another fellow had felt the winds coming down over the Australian deserts and hell was nothing compared to them and Satan went up and reported to St. Peter again and he said he would lose his job sooner than he would have anything more to do with sailors. Finally St. Peter said under those conditions you can throw the whole gang out. So Satan went back and told them to get out. Then the sailors began to think that after all hell was not such a bad place and while they growled a little about the grub and the climate, etc., it was on the whole a much more comfortable place than perched up on a yardarm

of a vessel going up to Boston in the winter time frozen to death and they said they wouldn't get out. Satan went up again and he interviewed St. Peter, this time Peter got very much irritated. He told him to get them out as that was his proposition and he would have to do it or else keep the sailors. This was a time when it was quite customary to serve grog two or three times a day on board ship and the greatest privation these fellows had had in hell was that they didn't get the grog. Finally the boatswain told Satan that he could get those fellows out if he would give him a permanent job down there and good treatment. So the boatswain went outside the gate and piped the call for grog and every sailor ran as hard as he could and there was a general rush to get out as they had not had any drink for a long time and when they all got out the gate Satan worked a low down trick and slammed the gate shut on the whole lot of them, boatswain and all, and turned them into Mother Carey's chickens and there haven't been any sailors in hell ever since."

SHIP BUILDING INVESTMENT CO.

The Ship Building Investment Co. was incorporated under the Nova Scotia Co.'s act in 1905 with a capital of \$50,000 for the purpose of securing a site on Halifax Harbor for the construction of steel and iron ships. This company has purchased and paid for property approximating 150 acres at Dartmouth on the shores of Halifax Harbor. Legislation has been secured to authorize the city of Halifax to give a bonus of \$100,000 to the first steel ship building yard established at Halifax Harbor. The town of Dartmouth has promised a similar bonus, and there will probably be a provincial subsidy of the same amount. In addition the company is endeavoring to obtain from the Dominion government a bounty of \$6 per ton and a further bounty per indicated horse power on all ships and engines constructed in Canada. The officers and directors are: President, G. S. Campbell; vice president, J. H. Johnson; other directors, B. F. Pearson, G. Stairs, J. W. Allison, J. B. Longard, Halifax, N. S.; G. B. Hunter, of Swan & Hunter, Newcastle-on-Tyne, Eng.; secretary, B. F. Pearson, Halifax.

The little towing steamer City of Grand Rapids, lound up with two coal laden barges, ran aground on Fighting island.

LAKES TO THE GULF DEEP WATERWAYS ASSOCIATION.

The Lakes to the Gulf Deep Waterways Association was organized at St. Louis last week at the deep waterways convention. The object is to promote the building of a deep waterway from the Gulf of Mexico to the great lakes. The association took definite form by the election of the following officers:

W. K. Kavanaugh, St. Louis, president; David R. Forgan, Chicago, first vice president; M. J. Sanders, New Orleans, second vice president; S. M. Neely, Memphis, Tenn., third vice president; J. L. Hebron, Greenville, Miss., fourth vice president; Greenfield Quarles, Helena Ark., fifth vice president; William F. Saunders, St. Louis, secretary; George H. Monroe, Joliet, Ill., treasurer; Thomas E. Hunter, Chicago, sergeant-at-arms.

The officers and the following constitute the board of governors: John M. Palks, New Orleans; Judge W. M. Kavanaugh, Little Rock; R. R. Bourland, Peoria, Ill.; James E. Smith, St. Louis; James F. Buckner Jr., Louisville, Ky.; Druew Musser, Little Falls, Minn.; Thomas C. Wilkinson, Burlington, Ia.; R. E. Osborne, LaCrosse, Wis.; Charles Scott, Rosedale, Miss., and James E. Warren, Memphis, Tenn.

The object of the association is well set forth in the following report of the committee on resolutions:

"The policy which has heretofore been pursued by the United States towards the improvement of the internal waterways throughout this country, with a view to developing the facilities for water transportation which might thereby be made available, contrasts most unfavorably with the treatment of the same question by all the other civilized nations.

"This policy of making meager provision for this class of work had its beginning under conditions when national development was in its infancy, and our nation has not yet come to a realizing sense that we have by our vast development of industries within a comparatively few years far outgrown that state which justified such a parsimonious treatment of so great interests.

"It is our conviction that the time has arrived for a generous expansion of our national policy towards all works of internal improvement, which have heretofore occupied such a subordinate place in national expenditure, especially in comparison with the great sums that have been appropriated in recent years for army and navy purposes, which appropriations have by far exceeded the expenditures for all other

departments of our government; and we believe that now the work of internal improvement for the promotion of the nation's industries ought to have a recognition commensurate with their importance and bearing a juster proportion to the expenditures for war purposes.

"In the belief that, when backed by progressive public sentiment, the United States congress can be induced to embark upon a liberal policy for the development of the internal waterways of the nation, it is the object of this convention to direct public attention especially to the project for a deep waterway channel to extend from the great lakes to the gulf of Mexico, and to urge all who are interested in this and allied projects for waterways improvement to the most determined and energetic efforts for its accomplishment.

"From the great lakes to the gulf of Mexico the Mississippi valley, through which it is proposed to construct this waterway, has an area of 1,350,000 square miles. It is 2,500 miles in length and 2,000 miles in width; within its boundaries lie the greatest producing states in the union; the arms of its principal river reach out from east to west, and, with the Missouri, form the boundary lines of twenty-one states and offer 20,000 miles of navigation. A splendid opportunity is here offered for this proposed deep waterway to give to the nation facilities for the cheap transportation of its commodities. The Mississippi valley produces 75 per cent of all our foreign exports, only a small portion of which, however, finds a direct route to foreign markets. Commerce for export should go direct, and in American bottoms. Give to this fruitful region cheap and necessary means of transportation, and a mighty impetus will be given to the ship building industry, by no subsidies save the expenditure by the government of money in the permanent betterment of channels.

"An American merchant marine has grown up on the great lakes which excels the merchant marine of any foreign nation, except England and Germany. Machinery for the rapid handling of cargoes, such as seen in no other part of the world, has been invented and placed in extensive use in lake transportation. The capacity of the ships in active carrying of freight has been greatly increased and cargoes of 100,000 bu. of grain are loaded within five hours and unloaded in six hours; 5,000 tons of ore are placed on ship board within three hours and the cargo is taken out in

the light of a working day. Coal drops from the car-dumping machines into the holds of vessels and within three hours of the time they tie up to the dock they have on board from 3,000 to 5,000 tons and are ready to sail. Again, vessel owners claim that nowhere in the world has the art of handling freight economically and rapidly reached so high a state of perfection as in the lake service. The ships built at the lake ship yards during the present decade will compare favorably with the vessels of the same class built anywhere in the world, and we might call attention to the fact that the marvelous development of Chicago is due largely to the location of the city at a point where railroad transportation and water transportation meet. The growth of the city has been but the reflex of the development of the west and south and traffic has come to Chicago because their products could be shipped at lower rates through the Chicago river than elsewhere.

The proposed deep waterway is to extend from the Chicago drainage canal through the valleys of the Des Plaines and Illinois rivers to the Mississippi river at Grafton, Ill., and thence down the Mississippi to St. Louis, and is to have a minimum depth of 14 ft. throughout. We recommend that for the purpose of meeting the probable future needs of navigation the minimum depth over the miter sills of the locks should be 21 ft. in the initial construction.

"The construction of such a deep waterway from the great lakes to the gulf of Mexico has engaged the attention of thoughtful people for many years, and a number of surveys have been made by the United States government from time to time in the past to determine whether the undertaking is practicable. The reports of these surveys made by the United States engineers recommending that the work be done were accompanied by such large estimates of cost that no practical steps have ever been taken for its accomplishment.

"The excessive cost of the project, as shown by the engineers' estimates, was due mainly to the existence of the prominent barriers between the great lakes and the Mississippi valley, lying in the vicinity of the lakes. This chief obstacle to the prosecution of this project has been happily removed through the enterprise of the city of Chicago, by which the drainage canal has been excavated across the above-mentioned barrier at a cost of over \$50,000,000 to that municipality.

"According to the estimates based upon recent surveys by the United States engineers, the work remaining to be done in order to complete the deep waterway channel to St. Louis, will cost \$31,000,000, or little more than one-half the amount which has been expended by the city of Chicago in opening the way for this enterprise through the great obstacle that was presented in the vicinity of Lake Michigan.

"Pending the inauguration of this work, it seems important that the United States should exercise such control over the Des Plaines and Illinois rivers as to prevent private persons, companies or corporations from erecting any dams or other structures that might present obstacles to the prosecution of the work as contemplated by the congress of the United States in ordering the surveys, plans and estimates for which the sum of \$200,000 was appropriated and expended.

"Having considered the deep waterway enterprise from Chicago to St. Louis, it now remains to deal with the subject of its further projection southward to the gulf of Mexico. The treatment heretofore bestowed on the lower Mississippi river by the United States government has, for the want of sufficiently large appropriations, been restricted to the policy of merely temporizing work in order to make provision to meet the immediate needs of the navigation interests.

"In conjunction with the prosecution of the deep-water enterprise from St. Louis northward, it becomes at once a matter of grave importance that adequate provision should be made by congress for the application of work of such substantial character to the lower river as to give fixedness to the channel and stability to the caving banks, accomplishment of which is the necessary basis of any plan for a permanent improvement and deepening of that part of the river.

"Inasmuch as the constitution confides to the general government the regulation of commerce with foreign nations and among the several states, an essential means to which is adequate and economical transportation facilities; gives it exclusive jurisdiction over the navigable waters of the United States, and enjoins upon it the promotion of the public welfare, no exercise of its power is more legitimate, no expenditure of money more fully authorized, and no duty more imperative than such improvement of waterways of national importance as will secure adequate and economical transportation for the products of the people.

"Believing present transportation facilities of the United States to be inadequate and wholly unsatisfactory, we favor appropriations by the congress of the United States in sufficient amounts to create such additional transportation facilities as the growing needs of the nation demand, and to the end that such appropriations shall be secured, this association recommends to its representatives in congress diligent, assiduous and untiring efforts to secure the necessary means with which to develop a deep waterway.

"In conclusion, the Lakes to the Gulf Deep Waterway Association sends greeting to our co-laborers in the great work of inland waterways improvement, the Missouri Valley River Improvement Association, the Upper Mississippi Improvement Association, the Lower Mississippi Improvement Association, and the Ohio River Improvement Association, and all other kindred associations, in this great valley, and assures them of our sympathetic interests of the object of their efforts and most cordial and energetic co-operation."

MR. FRANK H. HALL.

Frank H. Hall, son of J. A. Hall, and a member of the firm of J. A. Hall &



MR. FRANK H. HALL.

Son, weighmasters at Buffalo, was born at Albany, N. Y., and comes naturally by his connection with the grain business, as his father has been interested in it one way or another for over forty years. He started his young career in the New York Central elevator at Buffalo, and he has been in his present business since last May.

The schooner S. A. Wood was badly burned in a north branch of the Chicago river last week.

SCIENTIFIC LAKE NAVIGATION

By Clarence E. Long

TO MOVE OVER THE CARD.

In allowing or applying the variation you merely move over the face of the compass card from the point to be corrected as many degrees or quarter points as the variation calls for, and above all, do not imagine that it is the card that should move; it has already moved by the effects causing the variation. Bear in mind to imagine yourself in the center of the com-

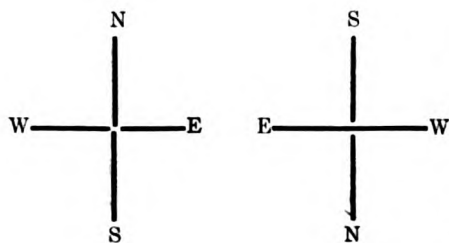


Fig. 1.

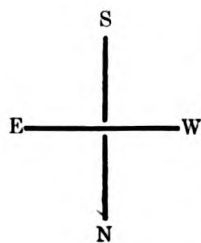


Fig. 2.

pass looking out over the point being corrected, and you can make no mistake.

HOW IT AFFECTS THE COURSE.

Remember, that with easterly variation the vessel is drawn to the right of all true courses supposed to be steered. It must now be very plain to the student that if easterly pulls the vessel to the right that in order to correct for it beforehand it is only necessary to move against the direction in which it pulls, or to the left, and the same with westerly variation, which pulls to the left if not allowed for, so allow to the right. There it is in a nutshell. Remember this for it bears out what is to follow.

WHY IT IS.

The method of correcting a true course (or bearing) to obtain the correct magnetic course, or bearing, will be readily understood by means of an example. Suppose the variation of the compass is found to be one point easterly, that is, the card is directed, or slewed, to the right one point from its proper position—north on the compass pointing N by E true instead of north; then the N by W point of the compass card will evidently point to the true north, and every other point on the card will be shifted round one point. If therefore, you wish to sail true north with one point of easterly variation you would have to steer N by W (the C. M. C.), but in reality you would be heading in a true north direction, though your compass shows N by W. In a similar manner it may

be shown that when the variation is one point westerly the C. M. C. will be one point to the right of the true course, which would be N by E, but which in reality is the true north on your compass.

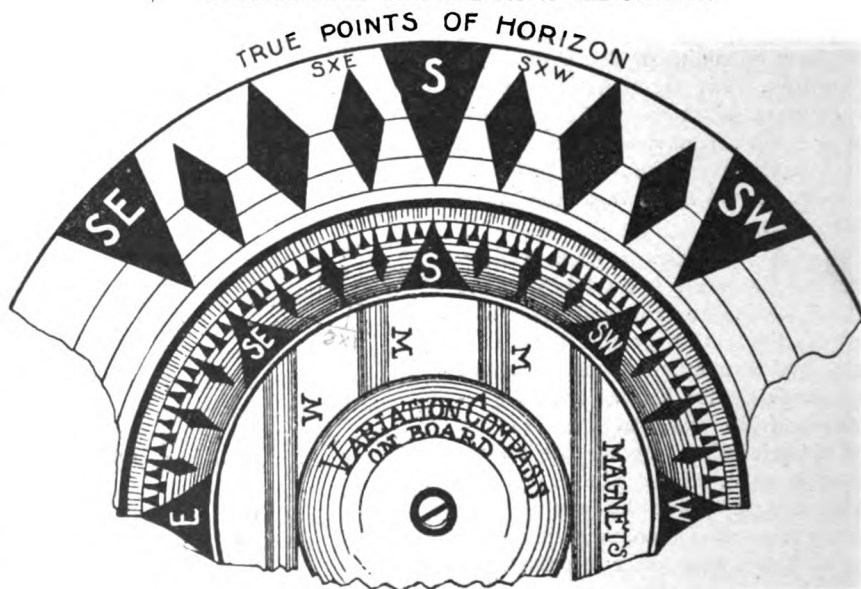
CHART AND GEOGRAPHICAL COURSE.

Note.—Sometimes the true course or bearing, is called a chart course, or bearing. They are the same. The term chart course is employed a great deal. It is the true course or bearing taken from the chart and read from the true compass rose and is unaffected either by variation or deviation. Geographical course or bearing is the same thing. To prevent possible confusion of the various terms it will be well for the student to use true course altogether instead of chart course and geographical course. At least here seems a good place to make the required explanations concerning them.

front of the observer, while an error could scarcely arise when correcting courses in the NE and NW quadrants, it could in the SE and SW quadrants, unless the student bore in mind that in the latter instance the compass card should be placed before him as if he were facing the south, that is, as in Fig. 2.

All the student has to do is to remember the terms easterly and westerly as applied to the compass, and he can make no mistakes. He must always bear in mind that with easterly variation the point south on the compass is shifted to the right and with westerly to the left, the same as with north, or any other point for that matter. As we said before this is due to the fact that many books and writers lay too much stress on the point north, making it the top of the compass and south the bottom, instead of

WHEN SOUTH IS MADE THE TOP OF THE COMPASS.



WHEN SOUTH IS THE TOP OF THE COMPASS.

Again we call attention to the fact that the student must be careful in correcting courses to remember that he is to suppose himself looking from the center of the compass card over the point to be corrected. When he places the compass card with the north point before him, mistakes frequently occur in the application of the variation in the southern semi-circle of the compass, between the east and west points round by south; thus, taking the compass as shown in Fig. 1 with the north point placed before or in

working from the center and looking over the point to be corrected.

Note.—Facing north east is on the right hand and west on the left hand; but in facing south, east is on the left hand and west on the right hand. This is what makes it puzzling to the novice in these matters; they got east and west mixed up with easterly and westerly. East and west have nothing to do with it; it depends entirely on which way the card is pulled, whether to the right or to the left—easterly or westerly. Facing any point of the compass easterly and westerly

will always maintain their same direction—to the right and to the left—all the way round the circle. Not so with east and west.

Showing westerly variation (1-point).—Is not the inner compass turned to the left of the outer compass? The inner compass is affected by variation only, while the outside compass shows the true points of the horizon at any place.

TO MAKE A PORTABLE COMPASS.

Draw a circle with a radius of about

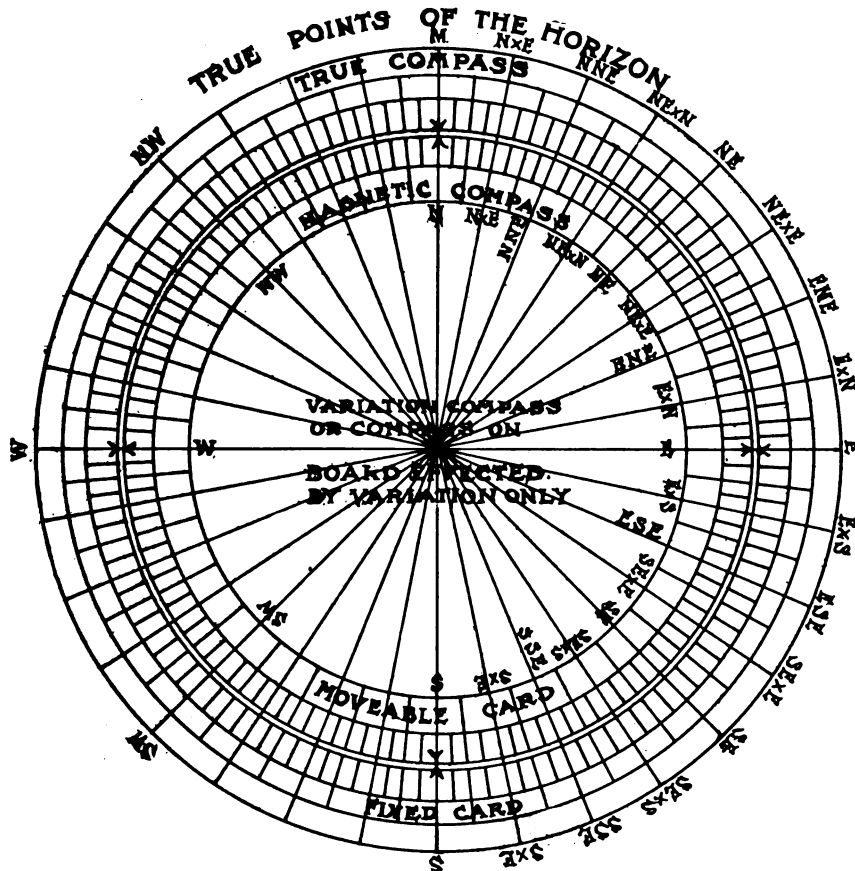
for the quarter and half points. Now cut around the outer circumference with a pair of scissors, and it then represents a portable compass card. Pin the center of this latter card to the center of the former—pivotal like. Now turn the inner card so that its north point coincides with that of fixed north. The fixed points of the compass on the outer circle represent those of the horizon, which never change. Those on the inner movable

drawn 1 point to the left of true north it must also be drawn 1 point to the left of true south and so it is; then the point on the compass card indicating true south must be S by W, the C. M. C., for every point of the compass card is slewed round to the left just that much, and as the rule tells us to apply Wly. Var. to the right of the true course to obtain the C. M. C., we move 1 point to the right of true south and get S by W for the C. M. C., which in reality is true south. See foregoing diagram for a graphic illustration of this example.

THE PORTABLE COMPASS CORRECTOR.

To illustrate the foregoing example for yourself, use the portable compass corrector, representing true and magnetic points of the horizon; the outer card represents the true and fixed points of the horizon, and the inner card the compass on board ship, that is, a compass on board ship absolutely free from deviation (which would have to be in a wooden ship, without a particle of iron on board, either in her construction, equipment, or cargo, and beyond the influence of "local attraction"). Use the inner compass only. Now, if there is no variation, movable north and fixed north coincide (coincide means to have the same position.) Always before using this device turn the inner card representing the compass on board ship, so that the same points coincide or come together with those on the outer card. One point of Wly. variation swings movable south one point to the left, that is, you swing your inner card so that south on it comes in line with S by E on the fixed card. Your whole compass is now affected by one point of Wly. variation. Examine it and you will find that every point on it has moved one point to the left of its proper place; but your fixed, or true points will not have moved, and that all your true points are one point to the right of the compass points (which is another reason for allowing Wly. variation to the right); and that to find the C. M. C. for any given true course all that is necessary is to find the true course on the outside compass and move in on the point until you coincide with a point on the inner compass, and this will be the C. M. C., that is, whatever your variation amounts to swing the inner card to the right or left of true north or south by its amount and according to its name; then whatever the true course is pick it out on the outside card and move in on it till you come to the mark coinciding with it on the inner card, and this will be the C. M. C.

In the above example true south



two inches, and then divide its circumference into 32 equal parts, or points. Connect these with the center by drawing radial lines. Scribe another circumference inside the first one with a radius of a quarter inch less, and another a quarter inch less than the second. Between the two outer circumferences draw in the quarter and half points. Mark the quarter points in between the first two circumferences, but the half points want to be drawn from the outer to the inner circle. On the outer circumference write the abbreviated name of each point in the order in which it comes. Cardboard should be used for the purpose. Now, on another piece of cardboard scribe a circumference with a radius of an inch and a half. Mark in the points of the compass with the name. This time write the name inside the circle, alongside the radial line. Draw two more circumferences inside of these

card represent those on the compass aboard ship. To get the right idea of this examine the double rose diagram on any navigation chart of the lakes — the true and magnetic compasses. These will explain fully what is meant.

As you have already learned the significance of right, or easterly, and left or westerly, on the face of the compass card, it will be unnecessary to say more on this subject. The following example will clearly show the significance of these terms:

The true course is south, the Var. (this is the abbreviation for variation), is, 1 point Wly., what is the C. M. C.? Here the true course is south, and one point to the right of south (Wly. Var. you know, allow to the right, because it pulls to the left if you do not allow for it) is S by W, which is the C. M. C., the true course corrected for Var. Now, if the compass card is

would come on S by W (the C. M. C.) of the inner card; NW true would come on NW by N; W true would come on W by N, and so on round the card. Examine it and see for yourself. Thus you will see at once how a true course is corrected to obtain the C. M. C. in accordance with the rules laid down.

In every example stated, or those made up by yourself, or those taken from the chart (which are of practical value and used in everyday navigation) all that the student has to do, in order to prove or verify his work, is to turn the card representing the compass on board ship as many points, or degrees, to the right or left of the fixed or true north as you have variation easterly or westerly, and you will see at once how each separate point is affected.

SHOULD PRACTICE ASSIDUOUSLY.

The student should practice with the course corrector, assuming different quantities of easterly and westerly variation to the true course to obtain the correct magnetic course, and to keep ever-lastingly at it until he thoroughly and clearly understands the whys and wherefores of the various rules involved. Also, remember what has been said about true course, and correct magnetic course, and do not get them confused with something else, but keep them distinct in your mind, and avoid calling them by names other than those here given.

EXAMPLES FOR PRACTICE.

Here are some examples for practice: If the true course is NE with $\frac{1}{2}$ point of Wly. variation, what is the C. M. C.? Answer NE $\frac{1}{2}$ E. because Wly. variation is allowed to the right of the true course to get the C. M. C. and $\frac{1}{2}$ point to the right of NE is NE $\frac{1}{2}$ E.

Taking the courses between north and south round by east:

Let the true course be NE by E, where the variation is $1\frac{1}{4}$ points Wly., the C. M. C. (allowing Wly. variation to the right) will be ENE $\frac{1}{4}$ E.

Taking the same course, viz., NE by E, where the variation is $1\frac{1}{4}$ points Ely., and then the C. M. C. (allowing Ely. variation to the left) will be NE $\frac{1}{4}$ N.

Supposing the true course to be SE by E, where the variation is $2\frac{1}{4}$ points Wly., the C. M. C. (allowing variation to the right) will be SSE $\frac{3}{4}$ E.

But the same course, viz., SE by E, where the variation is $2\frac{1}{4}$ points easterly, will give the C. M. C. (allowing Ely. variation to the left) E $\frac{3}{4}$ S.

Taking the courses between north and south round by west:

Let the true course be NW by W, where the variation is $2\frac{1}{4}$ points Wly., then the C. M. C. (allowing Wly. variation to the right) will be NNW $\frac{1}{2}$ W.

Suppose the course to be the same, viz., NW by W, where the variation is $2\frac{1}{4}$ points Ely., the C. M. C. (allowing Ely. variation to the left) will be W $\frac{1}{2}$ N.

With the true course west, and the variation 2 points Wly., then the C. M. C. (allowing 2 points to the right) will be WNW.

Taking the same course west, supposing the variation to be 2 points Ely., then the C. M. C. (allowing 2 points to the left) is WSW.

With the true course SW $\frac{1}{2}$ S, where the variation is $2\frac{1}{4}$ points Wly., then the C. M. C. (allowing Wly. variation to the right) will be SW by W $\frac{3}{4}$ W.

But with the same course, viz., SW $\frac{1}{2}$ S, where the variation is $1\frac{1}{2}$ points Ely., the C. M. C. (allowing easterly variation to the left) will be SSW.

If the true course is east, variation $\frac{3}{4}$ point Ely., what is the correct magnetic course? Answer E $\frac{3}{4}$ N because Ely. variation is applied to the left.

If the true course is SW, variation $\frac{1}{4}$ point Wly., what is the C. M. C.? Answer SW $\frac{1}{4}$ W.

If the true bearing of a range (two lighthouses, for instance, or any two objects in the same line) was NNW $\frac{1}{4}$ W, variation $\frac{1}{2}$ point Ely., what is the C. M. C. bearing of the range? Answer NNW $\frac{3}{4}$ W.

In the above case the compass would read NNW $\frac{3}{4}$ W when the boat headed on this range (one light in line with the other) if there were no deviation. Now, be sure to remember and keep this in mind for it bears directly on what is to follow. A compass without deviation (the deflection of the needle due to the attraction of the magnetism of the boat itself, her equipment, etc.), will always read correct magnetic, that is, after the true course or bearing has been corrected for the variation, the compass should show the same reading as that of the correct magnetic bearing; if it does not then the difference between what the compass reads and what you know the correct magnetic bearing to be is the deviation of the compass. Now, as to which way this deviation is don't bother your head for the present, for it is explained in another chapter, and you will be led to it step by step.

THE PORTABLE COMPASS CARD.

The above drawing is a representation of a portable compass card used

for correcting courses and illustrating examples in the conversion of courses. It could properly be called a course corrector. It corrects the course mechanically and also proves the example mechanically.

The outer circle should be drawn on a piece of cardboard, and the points of the compass marked on it. The inner circle should be drawn on another piece, and then cut out, so that you have two separate compass cards. Pin the center of the inner card to the center of the outer card, and turn it around so that the two norths come in line with each other. It is then ready for manipulation. The outside compass card is the artificial representation of the true directions of the horizon of any place. Its points are fixed and never change. Those on the inner movable card represent those of the compass on board ship. It is supposed to be affected only by the earth's magnetism causing variation. No matter how much the inner card is turned the outer card remains always the same.

This contrivance is recommended, not for the purpose of making it unnecessary to learn the rules of course conversions, but to assist the student in learning the reason for such rules and to prove by sight instead of by figures, or mentally, the various operations made necessary in allowing for the corrections of the compass. Such a device is not only beneficial to the learned, but is helpful to the beginner, since it actually shows and proves the principles to be learned. It solves mechanically many of the simple problems of navigation which daily confront the navigator. In correcting courses so many disasters have resulted from a mistake being made in applying the variation or deviation the wrong way, even when the master had perfect knowledge of the rules of such application. The human mind is liable to error, but a machine which is correct will never make a mistake. To a navigator such a device is valuable to prove or detect errors in his work done by figures, thus making him doubly sure and at the same time giving him the confidence necessary in being correct. It is helpful to the beginner since it furnishes him with a foundation for laying down the correct principles to a thorough understanding of the rules and laws upon which the principles are built.

The student having made or provided himself with one of these course correctors or illustrators, should practice with it on all kinds of variations and in every quadrant of the compass,

until he thoroughly understands the reasons for the rules. The best practice is to work the example by figures, or by simply moving on a compass card, according to the example being worked, and then afterward to prove the example with the corrector. From such practice you will learn the principle of the rule before the rule itself. He will not have to trust to his memory for the rule, the rule will suggest itself from the principle, which has become imbedded in his mind.

QUERY.

My dictionary says that a knot is a division of the log-line, equal to a length of 47.33 ft. when the sand glass is 28 seconds; that is, the spaces between knots are equally divided into 47.33 ft. It also says that a knot is equal to a nautical mile; and also, that a knot is the speed of one nautical mile an hour. According to this the knot has a variety of meanings. I don't see how they figure that a knot is a speed of one nautical mile an hour when a vessel is making 10, 12 or 14 nautical miles per hour?

A MASTER.

The knot has a variety of meanings and it needs a qualifying term to explain each particular case referred to. The statement that a knot is a speed of one nautical mile an hour means that the nautical mile is taken as the unit for expressing the ship's speed per hour. The log-line is divided by knots into equal spaces, each of which is the same fraction of a nautical mile that the time during which the line is allowed to run out (usually 28 seconds) is of an hour. When the length of the log-line between each knot is 50.7 ft. it corresponds to a 30 second time interval. 50.7 ft. is the same part of a nautical mile that a half minute is of an hour; namely, the 120th part. Hence, if we divide 6,080 ft. by 120 we get 50.7 ft. (nearly), or if we divide 3,600 (seconds in an hour) by 120 we get 30. Here is a simple way of finding the length of a knot on the log-line corresponding to a glass running any given number of seconds: Add a cipher to the number of seconds run by the glass, and divide this by 6; the quotient will be the proportional length of a knot in feet. What is the length of a knot when the glass runs 33 seconds?

6) 330

55 ft.

Note.—This rule is not exact but has been found to apply very closely in practice.

SAILING CLOSE TO THE WIND.

Your question:—"Does a fore-and-aft rigged vessel (not schooner) sail closer to the wind on one tack than the other; if so, which one and the reason for the same?"

Answer:—

Theoretically there should be no difference if the sails are trimmed the same in both cases, and the wind is the same and with the same force, and all other conditions equally the same. But practically, this is not always the case. The sails are not always trimmed alike, and the wind and the sea are not always the same when the vessel is on both tacks. The steering could also have something to do with it, such as a vessel dragging her rudder more on one side than on the other, and also from some imperfections of her hull on one or the other side, thus preventing the hull from moving through the water as freely on one tack as the other. If a vessel does lie closer to the wind on one tack than the other under similar conditions, it is due to some such cause as mentioned, and from the variable conditions named no stated rule could, therefore, be given. If one vessel sails closer to the wind on one tack another vessel might do the same thing on the opposite tack. A vessel will sail closer to the wind in a stiff breeze than in a light breeze. There are a number of other conditions that might be named.

QUESTIONS FOR OILERS AND WATERTENDERS.—NO. 15.

151. What is meant by the elastic force of steam?
152. The density of steam is what?
153. When is steam at its maximum density?
154. What is meant by the relative volume of steam?
155. Under the pressure of the atmosphere alone can steam be heated above the temperature of 212 degrees?
156. What is meant by the sensible heat of steam?
157. What is the weight of steam compared to air?
158. What quantity of steam will one cubic inch of water make when evaporated under atmospheric pressure alone?
159. How much faster will steam flow into a vacuum than into the atmosphere?
160. Why is it that fewer marine boilers explode than stationary?

QUESTIONS FOR WHEELSMEN AND WATCHMEN.—NO. 20.

201. How would you navigate a boat from the intersection of Lower

and Upper St. Marys river Rgs. to abreast of Grosse Cap Reef gas buoy?

202. How close would you consider yourself safe in passing Grosse Cap Reef gas buoy with a deep loaded vessel?

203. Give the true bearing and distance from Detour Reef gas buoy to Detour lighthouse?

204. When heading on Frying Pan island and Pipe island ranges your steering compass reads north, how much is it out on that heading and which way?

205. Bound up Sault river and running on Frying Pan island and Pipe island ranges how close to Frying Pan island would you go before hauling so as to leave Frying Pan island on the port hand, and what turning mark would you use?

206. When wishing to haul your vessel so as to leave Pipe island on the starboard hand what turning mark would you use?

207. After making the turn at Pipe island what island should you have your boat heading on and what land mark should stern of your boat be on?

208. Supposing Sweet's Pt. crib and the spar buoy were taken away, how would you know when to haul so as to leave Lime island to starboard?

209. After making the turn at Sweet's Pt. what mark is generally used to head on and what mark is used to have stern of your boat on?

210. To make the turn at the upper end of Lime island what turning mark would you use?

QUESTIONS FOR MASTERS AND MATES.—NO. 19.

280. What is the difference between magnetic variation and magnetic declination?
281. What term do nautical men use when they mean magnetic declination?
282. The true courses are: SSW; N by E $\frac{1}{2}$ E; WSW and E by N, the Var. is 8° Ely in each case, what are the corresponding correct magnetic courses?
283. The true courses are N 58° E; S 6° E; N 89° W and S 50° W, and the Var. in each case is $\frac{5}{8}$ of a point Wly, what are the corresponding correct magnetic courses in each case?
284. The correct magnetic course is ENE $\frac{1}{2}$ E, Var. 6° Wly, what is the true course?
285. Have steered NW by compass having no deviation; Var. at departure 5° Ely and at end of course 3° Ely. What is the mean true course made good?
286. Compass course is south, wind

WSW, leeway $\frac{3}{4}$ -pt., Var. 16° Ely, Dev. 14° Ely, what is the true course the ship has made?

287. The compass course is $E\frac{3}{4}S$, wind S by E, leeway $1\frac{1}{4}$ -pts., Var. 20° Wly, Dev. 15° Ely, what is the true course?

288. The compass course is WNW, wind north, leeway 3 points, Var. 14° Wly, Dev. 8° Wly, what is the true course?

289. What is meant by the course made good?

290. What is a compass bearing?

291. What corrections are to be made to a compass bearing to make a true bearing of it?

292. What is the correct magnetic bearing of Pipe and Frying Pan islands range?

293. What is the correct magnetic bearing of the Duluth piers?

294. What is the correct magnetic bearing of the Water Works Intake Crib light when in range with the light situated on the west breakwater at the entrance to Cleveland harbor?

MR. SAMUEL F. COOK.

Mr. Samuel F. Cook who is the foreman of the Ashtabula Dock Co.'s



MR. SAMUEL F. COOK.

four clams at Ashtabula is only thirty years of age. He has been working on the docks for five years. He is also harbor master at Ashtabula and is practically known and admired by every master on the lakes.

COPPER HANDBOOK.

"The Copper Handbook," Vol. VI for 1906, issued Oct. 15, 1,116 pages; price \$5. Horace J. Stevens, editor and publisher, 222 Post Office block, I'oughton, Mich.

The sixth annual edition of the "Copper Handbook," the only pub-

lication devoted exclusively to the copper industry, has been issued, being several months later than usual in appearance, owing to the sickness of the author, last spring, but matter of much later date has been used than in preceding issues, so that the book is as nearly up-to-date as its predecessors, and far more bulky and exhaustive in its treatment of the manifold phases of an industry that is world-wide in scope.

The "Copper Handbook" is encyclopedic in scope, but is written throughout in plain language, easily understandable by those lacking a technical education. The work begins with a chapter on the history of copper, followed by articles on the geology, chemistry, mineralogy, metallurgy and uses of the metal, with eight chapters devoted to condensed descriptions of the known copper deposits of the globe. A glossary of mining terms will be found useful to all readers not thoroughly conversant with practical mining, milling and smelting. The statistics of the copper trade and of copper share finances are covered in forty pages of highly condensed and accurate tables.

The major portion of the book is devoted to a chapter describing practically all known copper mines of the world, and listing every copper mining company of importance. This chapter is arranged alphabetically, by titles, rendering it self-indexing, and saving more than 50 pages of double-column index that otherwise would be required to merely give the titles of 4,626 mines and companies listed in the book, there being 777 more titles than in the preceding annual edition. The descriptions range in length from two lines, in the case of unimportant old and idle properties to nearly 16 pages in the case of the Calumet and Hecla, a mine that employs seven thousand men and will have paid one hundred million dollars in dividends by April next.

The detailed descriptions in the main chapter of the book are especially valuable because of their completeness, covering, as they do, exact titles, full addresses, details of organization, officers and finance, in addition to full and careful particulars regarding location, area, mine development, equipment and prospects. Heretofore works of reference devoted to mines have confined themselves either to the financial or the mining end, but the "Copper Handbook" covers all the features of interest to investors, miners or scientists, not of one mine or company, but of thousands, not in one district, but in every district of the world.

IMPROVING BUFFALO HARBOR.

Buffalo as a port on the lakes has a great future in store for it, if the present tentative plans of Mayor Adam and the ideas of Capt. J. J. H. Brown are successfully carried out. In speaking of his home port, Capt. Brown talks with the enthusiasm of a man who has already lived to see marvelous progress and knows the limit is not yet in sight.

Mayor Adam contemplates a line of piers in the outer harbor between the harbor and shore line. He is now negotiating with the different railroads and if good fortune attends his efforts, the shore line will be lined with piers just as you find them at New York and the great seaports. They will be arranged in the same manner so that the boats will lay in great long slips. This will relieve the inner congestion in the creek and the Blackwell canal.

"My idea," said Capt. Brown, "is to create a winding basin just at the point where the boats now make the turn to go up the creek or the canal. I would extend Ganson street to within 100 feet of the Watson elevator and have a concrete pier at the end for public use.

"Extending Ganson street would mean to close up the Main street slip and probably necessitate tearing down the Richmond as well as the Watson elevators. But the additional area on either side and at the end would make up for doing so. If this were done, the modern freighters would no longer have to go out in the lake to wind around. This would mean economy and would help Buffalo by diverting traffic to her gates."

The Burlee Dry Dock Co., Port Richmond, S. I., N. Y., have the following work under way at their yard: A steel barge 192 ft. long, 34 ft. beam and $17\frac{1}{2}$ ft. for stock; a steel tug 115 ft. 2 in. long, 22 ft. 6 in. beam and 12 ft. 6 in. deep for the Staple Coal Co.; a steel tug 165 ft. 8 in. long, 29 ft. 4 in. beam, 19 ft. 3 in. deep, for stock; a steel lighter $110\frac{1}{2}$ ft. long, 30 ft. beam and 12 ft. deep for the New York Central R. R.; a steel tug 96 ft. 7 in. long, 23 ft. 6 in. beam and 12 ft. 9 in. deep for Tams, Lemoine & Crane; eight steel derricks 100 by 34 by 8 ft. for the Pennsylvania railroad; a steel tug 151 ft. 8 in. long, 26 ft. beam and 16 ft. deep, and a steel lighter $110\frac{1}{2}$ ft. long, 30 ft. beam and 12 ft. deep; both for the Lehigh Valley railroad.

The steamers Iroquois, Chippewa and John C. Howard have reached Montreal, en route to the west.

OUR NEGLECTED MERCANTILE MARINE.

It will be instructive just now, when so many are calling on us to increase our ships of war to notice what is the state of our commercial marine. Indeed, it is almost true that we have no foreign commerce under our own flag. Nearly the whole of our foreign commerce is in foreign ships, and that, too, when a hundred years ago and less we had a fine body of American vessels engaged in foreign trade. And then we had no navy. It might be profitable for our statesmen to discuss the reason for this extinction of a very profitable carrying trade and find and adopt a remedy. We have a splendid coasting marine, for the very good reason that our laws do not allow any other nation to take a share in its business, but our legislation is not sufficient to re-create our foreign commercial marine. During the year just closed the total net tons of American sail and steam vessels that entered our ports was 2,030,584 tons, an increase of 2½ per cent on the previous year. But during the last year the total foreign tonnage entering our ports was 17,418,386 net tons, or an increase of 1,922,247 tons, or about 12½ per cent. That is, the bare increase for one year of foreign tonnage engaged in commerce with this country was very nearly equal to the total tonnage of American-owned commercial marine.

While, during the last twenty years our navy has grown so prodigiously from almost nothing, our commercial marine has grown relatively smaller and smaller. We may be getting to be magnificent in the art of war, but in foreign commerce we are insignificant, so that our consuls abroad, in many cities, hardly see an American flag enter their ports once in a year. Our vessels may venture as far as Havana, and some may cross the Pacific to Manila or Hong Kong, but very seldom to the other Asiatic or African or Australian ports, where British and German ships monopolize the trade; and, indeed, very few are the American vessels that enter the Baltic or the Mediterranean.—*The New York Independent*.

REPAIR WORK AT BALTIMORE.

Baltimore, Md., Nov. 22. — Repair work in the local ship yards continues active though the major portion of the work is of a minor nature. William E. Woodall & Co. have the tug Anna W. and the Southern railway tug Southern, the latter having been damaged badly by fire and will have to be

practically rebuilt up from the water line.

McIntyre & Henderson have the British steamship Brookline at their yard for general repairs in the engine room.

Beacham has the gasoline barge Leland Mills out for overhauling. The Skinner Ship Building & Drydock Co., has the British steamship Greenback out for painting and fitting out to carry a cargo of grain; also the Norwegian steamship Hippolyte Dumois for general overhauling and the Western Maryland tug Sweepstakes for general repairs.

The Chesapeake Marine railway has the barge William Curtin out for caulking and painting.

The Spedden Ship Building Co. has the state oyster police steamer Governor Thomas for fitting out and the U. S. Lighthouse steamer Holly for repairs.

Booz Bros. have a number of small bay craft at their yard for hauling out and painting.

WATER LIGHT EXHIBITION.

A demonstration of the water light was given in New York harbor recently by the Coston Signal Co., of 7 Water st., New York, general agents of the Marine Torch Co., of Baltimore, Md., for the purpose of showing the power of this water light and to what uses it can be put. There are several kinds of these lights, one of which, the Buoy light, is attached to a life buoy which when thrown overboard unseals the light appliances and it ignites instantly that it strikes the water. The power of this light is 300 candle power, and it will burn from one hour to one hour and twenty minutes. Heavy seas or strong winds cannot extinguish it; the more water that reaches it the stronger it will burn. This machine only weighs about two or three pounds, and is about 9½ in. long, and about 5 in. in diameter. The other lights are: the Standard light which is used for a deck flare; The Railroad light for use in case of accidents on railroads and a light for construction work for use when building bridges, etc., and as a distress signal at sea. These lights have been adopted by the United States navy, the United States life-saving service, the Hamburg-American line, the Prince line and other steamer lines; the New York fire department and by the fire departments of a number of cities in the United States. The light is claimed to be the most powerful and only light of its kind in the world and can be used on land or sea. The exhibition of this light which took

place on the night of Oct. 24 at Pier A, North river, was in all respects successful, the power and brilliancy developed being so great as to make the entire yacht basin in which it was operated as bright as day.

ADVANCING MARKET IN ELECTRICAL APPARATUS.

Prices in the electrical trade continue to show a distinct upward tendency in sympathy with the well maintained advance which has taken place in the prices of all raw materials. Orders for future delivery can only be placed in many instances at a considerable advance over present market quotations. The General Electric Co., in common with many other large manufacturing concerns, is announcing a general advance in prices of electrical apparatus and supplies. This will not unlikely be followed by further advances if present market conditions continue.

SAWDOLET SHIP FLOORING.

In describing Sawdolet, a new ship flooring which is now being introduced in some lake steamers, in the issue of Nov. 8, it was stated that the thickness of the flooring was ¾ in. This should have read ⅝ in. In applying it to steel decks rough sawed hardwood cleats ¾ in. by 2-8 in. are bolted to the deck 12 in. to 14 in. on center with bolts spaced 12 in. to 14 in. The material is then laid ⅝ in. thick, forming a continuous floor.

BELL-SEGUIN COLLISION.

As a result of a collision in the St. Clair river at Port Huron, the big steel barge Sir Isaac Lothian Bell lies on the bottom in 20 ft. of water, while the steamer Seguin is at the Sarnia dock in a sinking condition. The Bell was bound up light, in tow of the steamer Rockefeller, and the Seguin was coming down with a cargo of lumber. The Seguin struck the Bell on the port side, at No. 3 hatch, and the hole extends from above the water line down to the tank top. The Bell is 365 ft. long and 45 ft. beam, and was built at West Bay City in 1895. It is owned by the Pittsburg Steamship Co. The Seguin is owned by J. B. Miller, of Toronto, and is 207 ft. long. It was built in 1890.

Stanley G. I. Electric Manufacturing Co., Pittsfield, Mass., has just put out a bulletin descriptive of the G. I. flush receptacle and attaching plug. The last page contains an index of all the company's latest publications, making, therefore, a good work of reference.

OBITUARY.

Capt. M. Morris, retired lake captain and the largest individual realty owner in Duluth, died last week.

Crocker Bros., Cliff and John streets, New York, announce the death of their senior partner, Mr. George A. Crocker, on Saturday, Oct. 20. Mr. Crocker was seventy-six years old.

Charles M. Payment, the retired vessel master, died suddenly of heart disease, at his home in Detroit last Sunday. He was well known during the early days on the lakes, but had not sailed for several years.

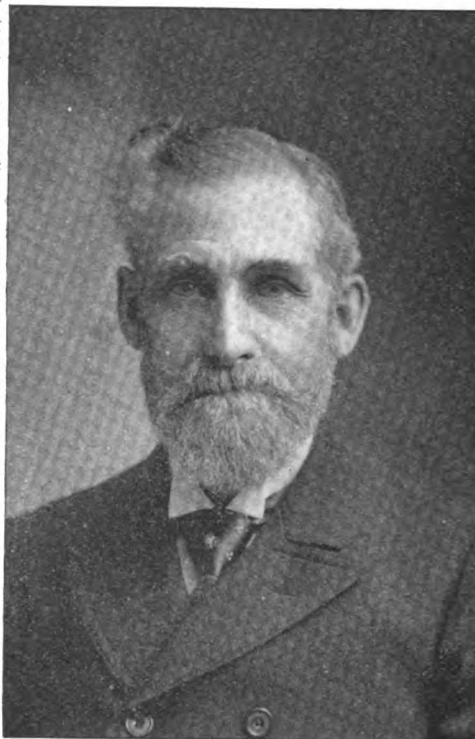
Capt. George A. Ford, a well known resident of Cleveland, and in the early days an experienced lake master, died at his apartments at the Haddam, Cleveland, on Saturday last. His father, Augustus Ford, who was a powder boy during the Revolution settled at Sackett's Harbor in the early part of the present century, and executed a chart of Lake Ontario. This survey of Lake Ontario was in constant use up to 1876, and was of great service during the war of 1812. It was natural that his son, George A., should become a sailor. During his lake career George Ford invented a number of devices for use aboard ship, one of them being a tackle block which is in present use, and which bears his name. He settled in Cleveland in 1872 and turned his attention to the development of a storage battery. His storage battery was actually applied on a street car at Cleveland long before the trolley system came into vogue. Capt. Ford was eighty years old. He was proud of being a real son of the American revolution.

DEATH OF CAPT. GEORGE McLEOD.

Capt. George McLeod, one of the most noted figures in marine affairs on the lakes, died Sunday morning at his Buffalo residence. His funeral services were held at 2:30 p. m. Wednesday from the Niagara street residence under Masonic auspices, with burial at Forest Lawn. He was over 70 years of age when death overtook him.

Capt. McLeod had been working for Smith, Davis & Co., since 1879, his official title being that of wrecking master. Prior to that he had sailed old time vessels like the Plover, De Sota, Flying Mist, St. Lawrence and the Northwest. He came from salt water in '56 to sail the lakes for the Winslows, of Chicago. He made a round trip from Chicago to Buffalo with grain and coal in the Northwest in ten days and eleven hours.

Capt. McLeod sailed the Lucerne in '77 and he had occasion to stand by the passenger steamer Peerless on Lake Michigan. The Peerless was leaking and had a load of passengers. The captain of the Peerless was a Knight Templar and he signaled Capt. McLeod a signal of distress. The answer was substantially that he would see him and his passengers through at any cost. For this act, the Peerless' owners, Leopold & Austrian, made



CAPT. GEORGE McLEOD.

him a valuable present and sent a letter of thanks.

In speaking of Capt. McLeod, Capt. J. J. H. Brown, of Brown & Co., summed up his wonderful character by the following words: "He was a singular man because he was gentle at all times but also resolute when occasion demanded. He combined gentleness and resolution in a most happy degree."

The deceased is survived by his widow, his daughter, Mrs. Thos. J. O'Brien, and his son, Dr. E. J. McLeod. Miss Ellen Kennedy, daughter of his first wife, who made her home at the McLeod residence, is also a survivor.

Capt. McLeod was an honorary member of the Shipmasters' Association.

WYOMING AN OIL BURNER.

The assistant secretary of the navy has contemplated for some time the fitting out of the war vessel Wyoming for the experimental use of fuel oil. The

Wyoming is lying at Mare Island navy yard, being largely used at present as a training boat. The plans received relate to the construction and repairs branch, and no action will be taken until the estimates are received. The work will no doubt be done at Mare island. The Wyoming will join the Pacific squadron and make cruises down the coast and to Honolulu, on the termination of which reports will be made to the government, making some comparison of oil and coal as fuel for vessels of the navy.

MARINE PATENTS.

Copies of these patents can be obtained by sending ten cents in stamps to Siggers & Siggers, patent lawyers, Suite 11, National Union Bldg., Washington, D. C.

835,139. Means for assembling blocks for marine dry docks, Arthur A. Morris, San Diego, Cal.

835,223. Anchor, Frederick B. Langston, Brooklyn, N. Y.

835,498. Lifeboat. Ole Brude, Aslesund, Norway.

835,530. Boat. Jasper N. Huff, Confluence, Ky.

835,800. Jury rudder. Reinert Olsen, San Francisco, Cal.

835,840. Mariner's compass. Frederick A. Strassweg, Evansville, Ind.

The annual meeting and election of officers of the Roberts Safety Water Tube Boiler Co., was held at Red Bank, N. J., on Nov. 1 and the following officers were re-elected: Edward E. Roberts, president; E. Gerry Roberts, vice president; William S. Blitz, secretary and John M. Hoffmire, Jr., treasurer. The directors declared the usual standard dividends, and the original stockholders have now received over 150 per cent on the cost of their stock.

At the monthly meeting of the directors of the Toledo Ship Building Co. held at Toledo on Tuesday of this week, a dividend of 7 per cent on the capital stock of \$1,100,000 was declared. The company has purchased 200 ft. additional river frontage adjoining its plant, giving it a total frontage of 1,000 ft.

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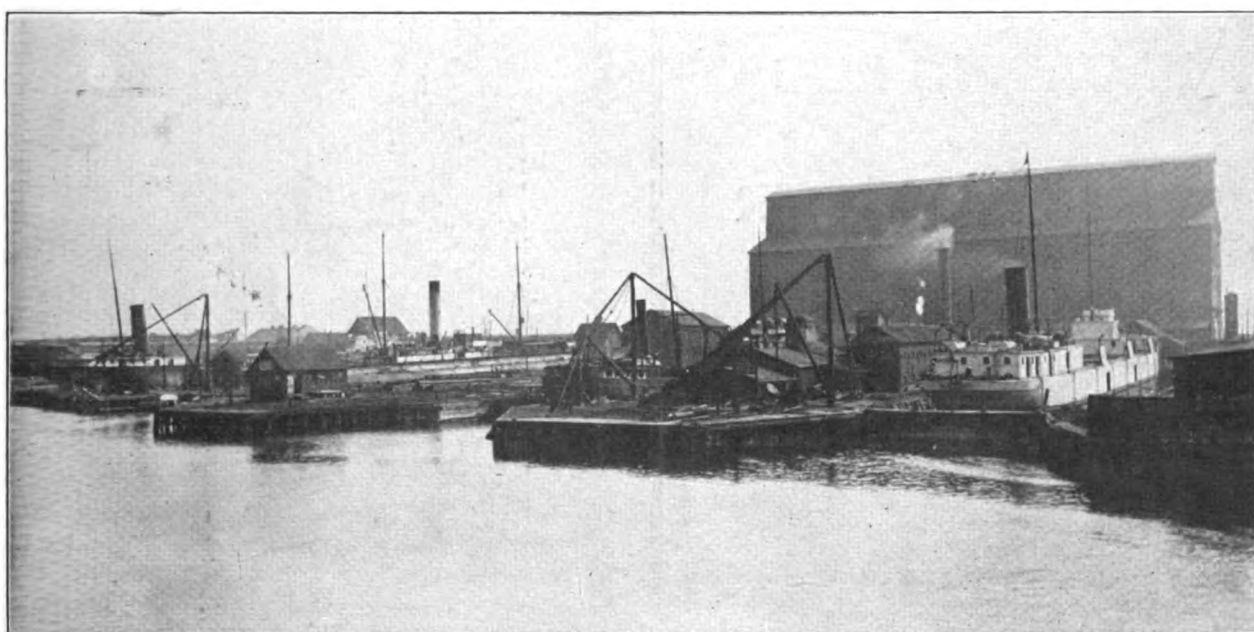
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THE MARINE REVIEW

VOL. XXXIV.

CLEVELAND, NOVEMBER 22, 1906.

No. 21.



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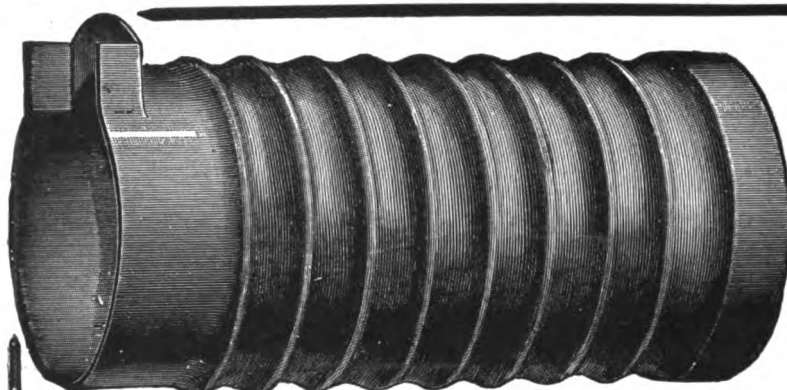
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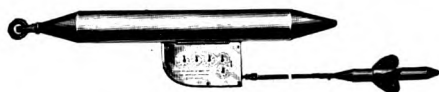
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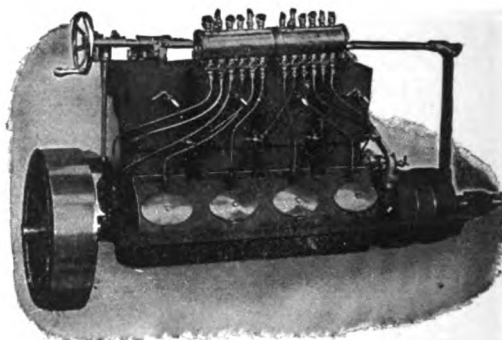
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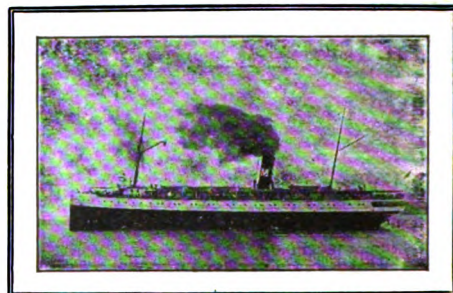
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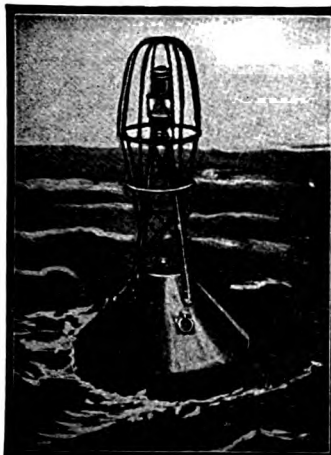
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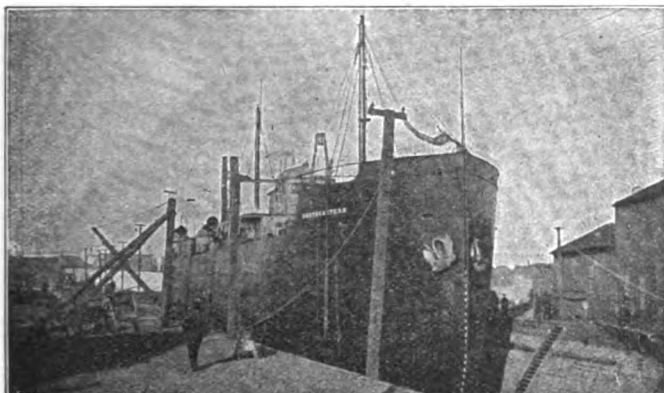
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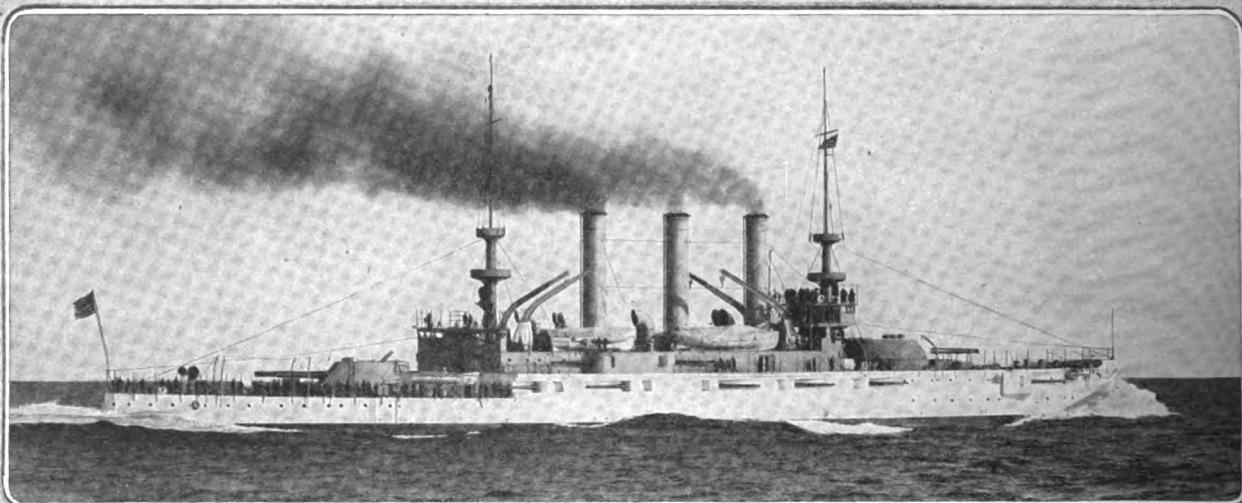
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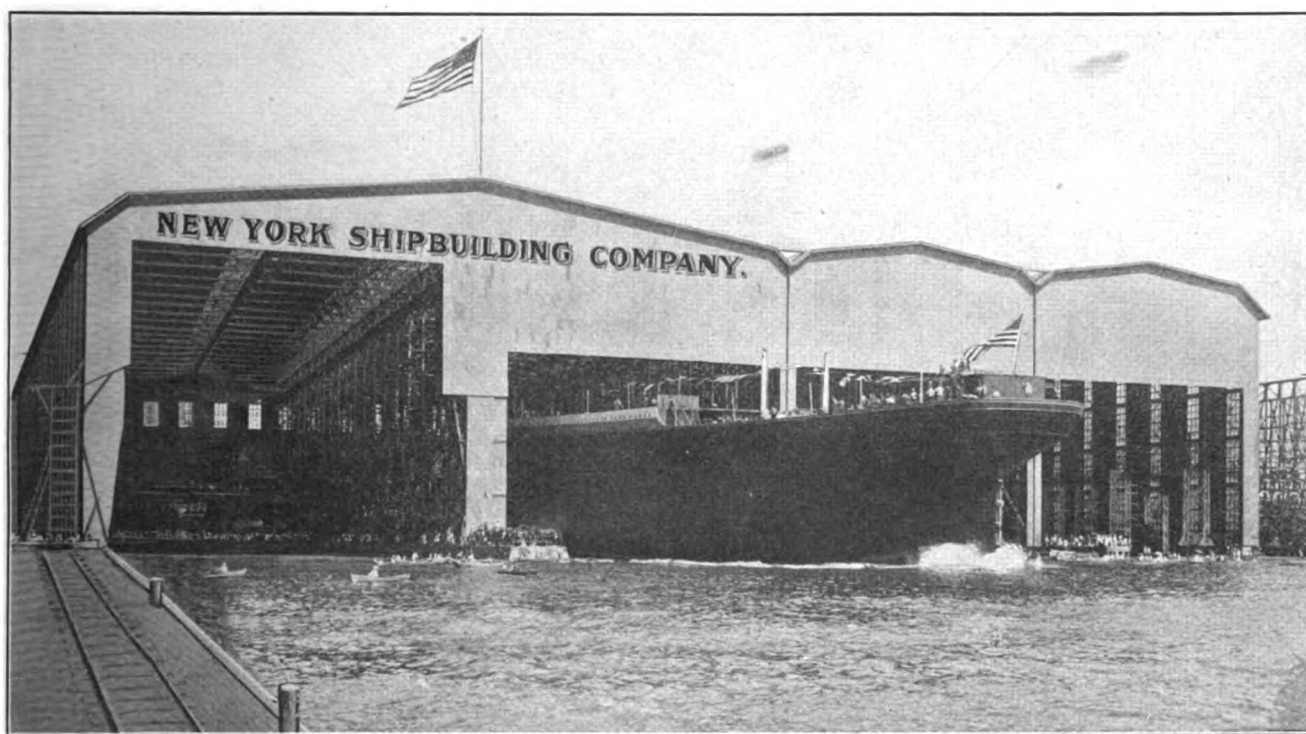
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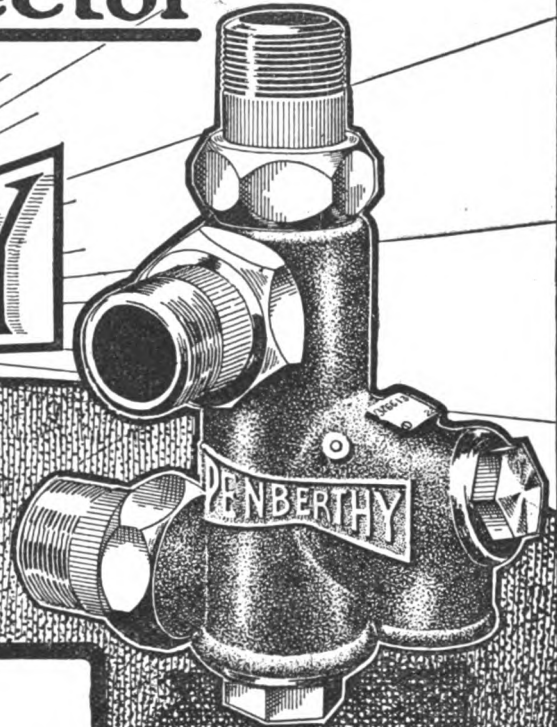
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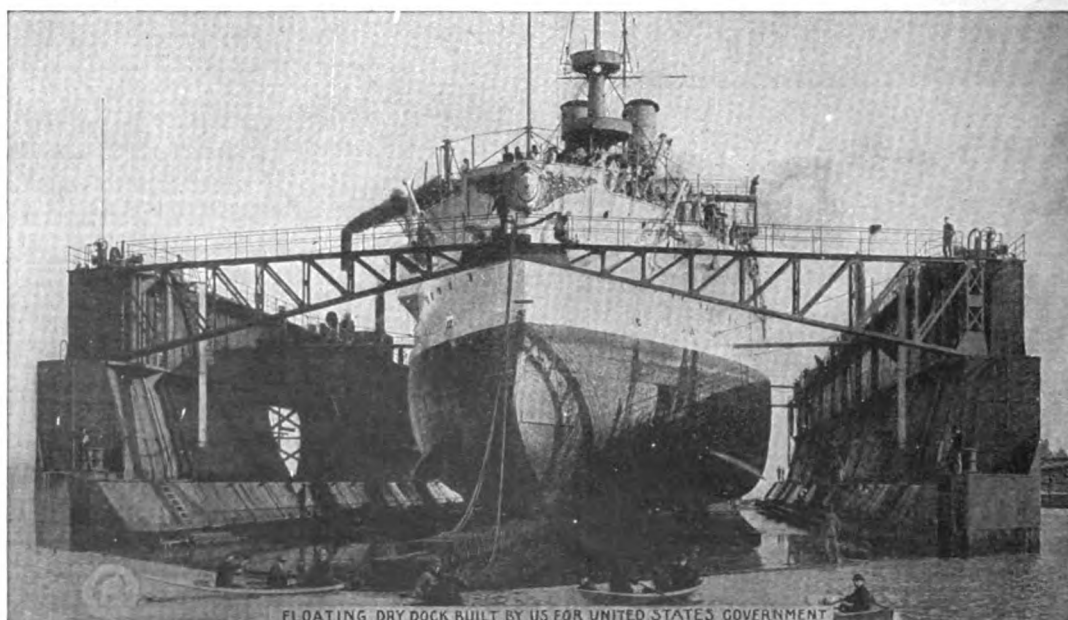
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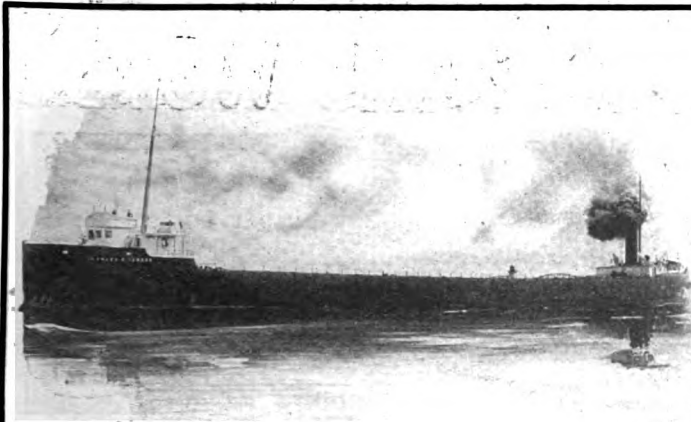
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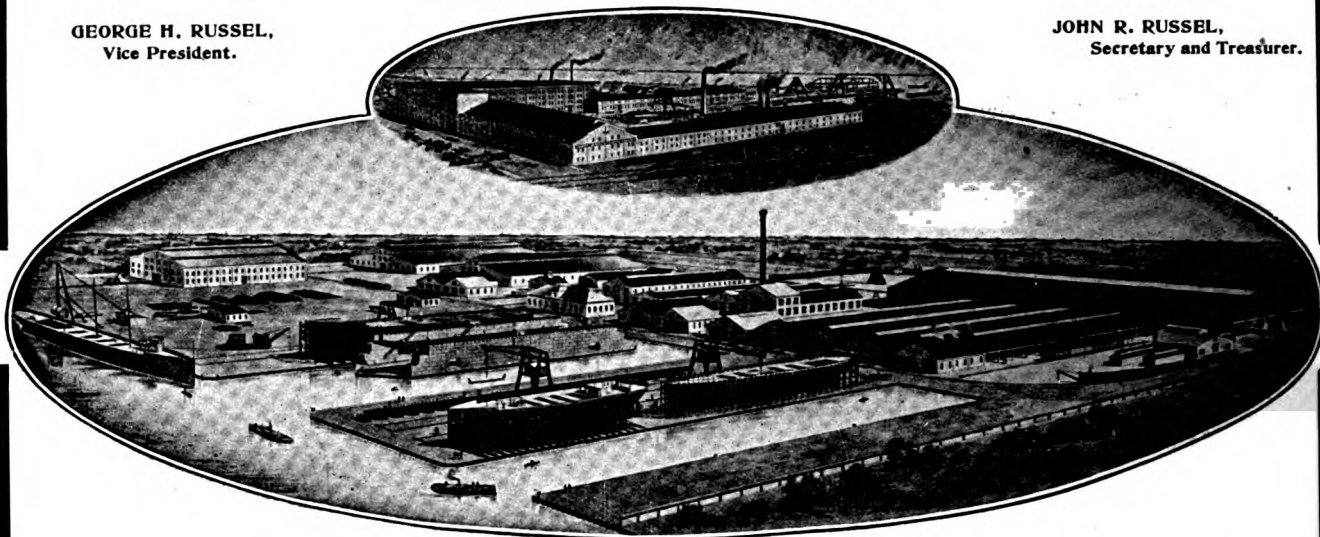
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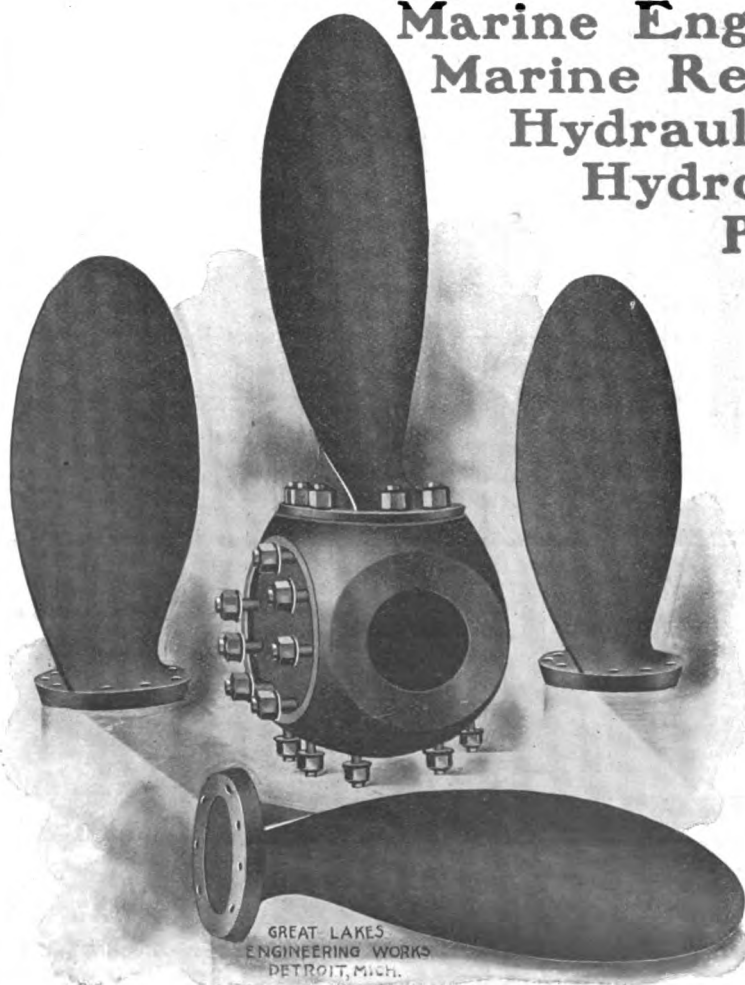
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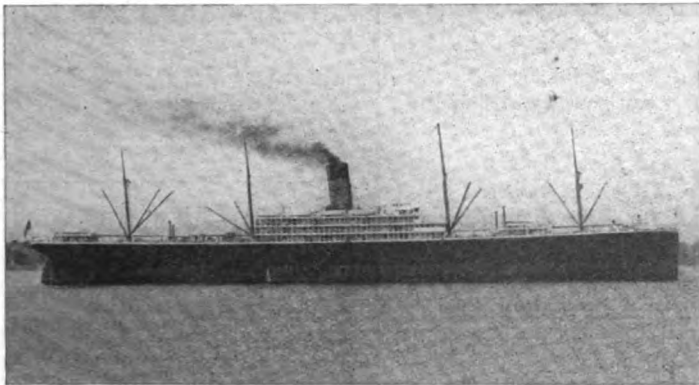
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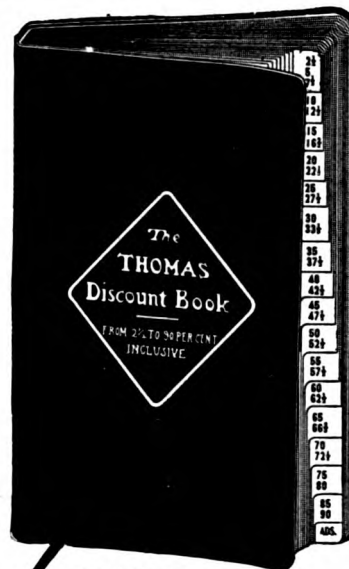
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FOR THE
CLASSIFICATION OF STEEL AND WOODEN VESSELS.



COMBINED AND ISSUED IN CONNECTION WITH
BUREAU VERITAS
INTERNATIONAL REGISTER OF SHIPPING.

THE RATINGS OF GREAT LAKES REGISTER GO BEFORE AND ARE ACCEPTED BY THE LEADING UNDERWRITERS OF AMERICA AND EUROPE. VESSELS BUILT UNDER THE SUPERVISION OF ITS SURVEYORS WILL RECEIVE SPECIAL RATING, AND WILL ALSO BE PUBLISHED IN BUREAU VERITAS INTERNATIONAL REGISTER OF SHIPPING.

PLANS AND SPECIFICATIONS FURNISHED.

GREAT LAKES REGISTER SURVEYORS ARE ESTABLISHED AT ALL THE PRINCIPAL PORTS ON THE GREAT LAKES.

F. D. HERRIMAN, SURVEYOR GENERAL,
230-322 Perry-Payne Building, CLEVELAND, O.

Position Wanted as Inspector of Hulls, Repair or New Work.

Age 26 years; 4½ years as hull draftsman; 2 years' experience on ship yard and mould loft and dry dock work. Familiar with all classes of lake construction. References from present employers. Box 105.

CHAS. E. & W. F. PECK

Insurance Brokers. Average Adjusters.

ESTABLISHED 1870.

NEW YORK, 58 William Street.

BOSTON, 153 Milk St.

BUFFALO, 914 The Fidelity Bldg.

CLEVELAND, 1006-1008 Rockefeller Bldg.

CHICAGO, 1114-15 Royal Insurance Bldg.

REPRESENTED BY

C. T. BOWRING & CO., (Insurance) LTD.,

5 and 6 Billiter Ave., LONDON,
and at "LLOYD'S" LONDON.

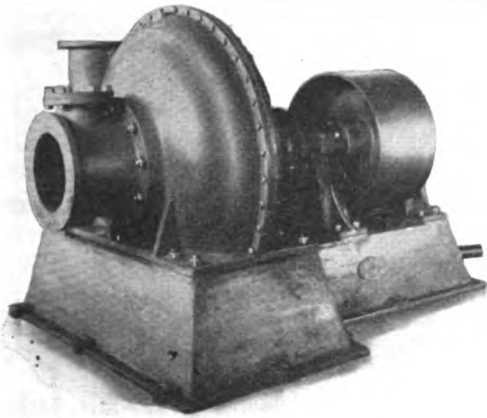
HULLS AND CARGOES.

We place insurances in the most advantageous markets, employing, in the interest of our clients and with equal facility, all Foreign and Home companies, at the best procurable rates and terms.

We Represent Only the Assured

Alphabetical Index of Advertisers

on page 49 this issue.



The Marine Iron Company

BAY CITY, MICH., U. S. A.

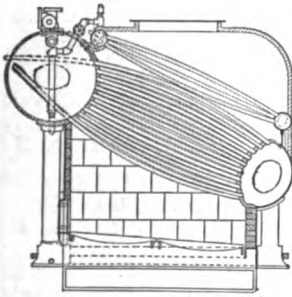
BUILDERS OF MACHINERY

FOR ALL PURPOSES.

**Dredging Machinery, Centrifugal Pumps
Hoisting Engines, Marine Engines.**

Boom and Crane Castings, Propeller Wheels, etc.
We shall be pleased to quote prices upon application.

THE MOSHER PATENT WATERTUBE BOILER

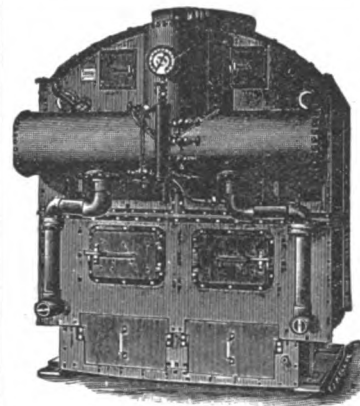


Simplest, lightest most compact boiler made. Most accessible for cleaning and repair. Five vertical rows or as many as 45 tubes may be cleaned or withdrawn by removing the cover from a single hand hole. Largest grate surface on a given floor space. No joints in the fire. All joints expanded. Greater steam room and water capacity than any other boiler. Built in sizes up to 2000 H. P. Moshier Boilers have been supplied for eleven torpedo boats and the monitor Florida of the U. S. Navy, amounting to over 26,000 H. P., six torpedo boats for the Russian Navy two gun boats for the Mexican government, one cruiser and one

torpedo boat for the Brazilian government; the steam yachts Arrow, Elide, Feiseen, Wauneta, Presto, and numerous other yachts and vessels.

SEND FOR DESCRIPTIVE CATALOGUE.

MOSHER WATERTUBE BOILER CO., No. 1 Broadway, N. Y.



350 STEAM VESSELS

Now Equipped With

**ALMY'S PATENT
SECTIONAL**

Water Tube Boilers

Bear Evidence of Their
Excellent Qualities

**ALMY WATER-TUBE
BOILER CO**

PROVIDENCE, R. I.

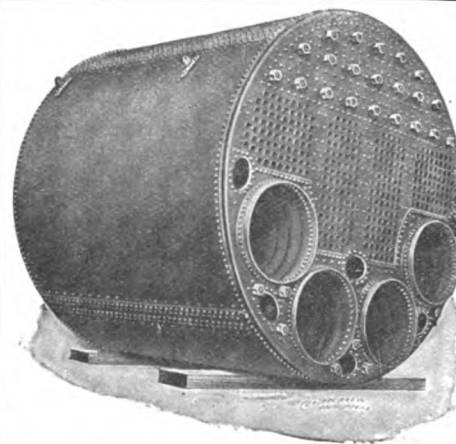


Taylor Water Tube Boiler Co.

Vertical Tubes, sectional, large steam space and liberating area. Fire box, combustion chamber, and course for the furnace gases similar to the Scotch Marine. Free circulation type.

Send for full description.

**322 Franklin St.
DETROIT, MICH.**



MARINE BOILERS

OF ALL TYPES

**KINGSFORD
FOUNDRY &
MACHINE
WORKS,**

Oswego, N. Y.

Northwestern Steam Boiler & Mfg. Co.

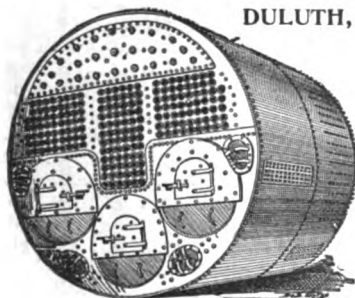
DULUTH, MINN.

Manufacturers of

**BOILERS, ENGINES
AND MACHINERY**

Special facilities for Marine Work. Repairs promptly attended to Night or Day.

We carry a complete
line of Marine and
Engineers' Supplies.

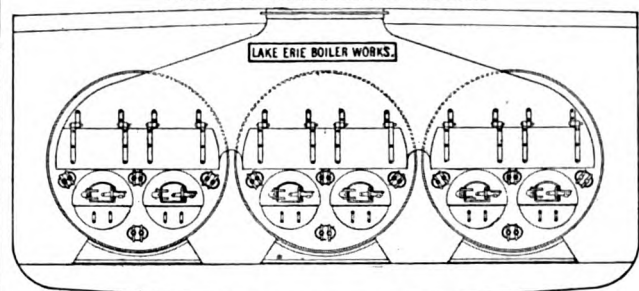


TELEPHONES: OFFICE AND WORKS, 615.

RESIDENCE CALLS: M. A. RYAN, Pres. and Gen'l Mgr., 776-R.
J. H. OPPERMAN, Secretary, 579-R; E. KRIZ, Superintendent, 557-M.

LAKE ERIE BOILER WORKS

RICHARD HAMMOND, President



THE BEST EQUIPPED PLANT IN
AMERICA FOR THE MANUFACTURE
OF MODERN MARINE BOILERS

BUFFALO, N. Y.

BUYERS' DIRECTORY OF THE MARINE TRADE.

For a more complete classification than that represented by advertisers in The Marine Review, see the BLUE BOOK OF AMERICAN SHIPPING, Marine and Naval Directory of the United States, published by The Marine Review, Cleveland.

[See accompanying Index of Advertisers for full addresses of concerns in this Directory.]

AIR COMPRESSION, HOISTS.
Great Lakes Engineering Works....
.....Detroit.

AIR PORTS, DEAD LIGHTS, ETC.
Marine Mfg. & Supply Co.....
.....New York.

AIR PUMPS AND APPLIANCES.
Fore River Ship & Engine Co.....
.....Quincy, Mass.
Great Lakes Engineering Works....
.....Detroit.

ANCHORS.
Bowers, L. M. & Co.....
.....Binghamton, N. Y.

ANTI-FRICTION METALS.
Cramp, Wm. & Sons....Philadelphia.

ARTIFICIAL DRAFT FOR BOILERS.
American Ship Building Co.....
.....Cleveland.
Detroit Ship Building Co....Detroit.
Great Lakes Engineering Works....
.....Detroit.

ASH EJECTORS.
Great Lakes Engineering Works....
.....Detroit.

ATTORNEYS AND PROCTORS IN ADMIRALTY.
Gilchrist, Albert J.....Cleveland.
Goulder, Holding & Masten.....
.....Cleveland.
Hoyt, Dustin & Kelley....Cleveland.
Jenkins, Russell & Eichelberger....
.....Cleveland.
Kremer, C. E.Chicago.
MacDonald, Ray G.....Chicago.
Maytham, Frank.....Buffalo.
Shaw, Warren, Cady & Oakes.....
.....Detroit.
White, Johnson, McCaslin & Cannon
.....Cleveland.

BAROMETERS, MARINE GLASSES, ETC.
Ritchie, E. S. & Sons.....
.....Brookline, Mass.

BLOCKS, SHEAVES, ETC.
Boston Lockport Block Co.....
.....Boston, Mass.

BLOWERS.
American Blower Co., Detroit, Mich.

BOAT BUILDERS.
Drein, Thos. & Son.....
.....Wilmington, Del.
Kahnweiler's Sons, David.....
.....New York.
Truscott Boat Mfg. Co.....
.....St. Joseph, Mich.

BOILER COMPOUNDS.
The Bird-Archer Co.....New York
Dearborn Drug & Chemical Works..
.....Chicago.
Lake Erie Boiler Compound Co.....
.....Buffalo.
State Manufacturing Co....Cleveland.

BOILER MANUFACTURERS.
Almy Water Tube Boiler Co.....
.....Providence, R. I.
American Ship Building Co.....
.....Cleveland.
Atlantic Works..East Boston, Mass.
Briggs, Marvin.....New York.
Chicago Ship Building Co..Chicago.
Cramp, Wm. & Sons..Philadelphia.
Detroit Ship Building Co....Detroit.
Fletcher, W. A. & Co.....
.....Hoboken, N. J.
Fore River Shipbuilding Co.....
.....Quincy, Mass.
Great Lakes Engineering Works....
.....Detroit.
Kingston Foundry & Machine
WorksOswego, N. Y.
Lake Erie Boiler Wks.....Buffalo
Maryland Steel Co.....
.....Sparrow's Point, Md.
McLaughlin Iron Wks ..Ashtabula, O.
Milwaukee Dry Dock Co.....
.....Milwaukee.
Mosher Water Tube Co..New York.
Newport News Ship Building Co..
.....Newport News, Va.
New York Shipbuilding Co.....
.....Camden, N. J.
Northwestern Steam Boiler & Mfg.
Co.....Duluth, Minn.
Quintard Iron Works Co.....
.....New York.
Roberts Safety Water Tube Boiler
Co.New York.
Superior Ship Building Co.....
.....Superior, Wis.
Taylor Water Tube Boiler Co....
.....Detroit.
Toledo Ship Building Co.....Toledo.

BOILER RIVETS.
Bourne-Fuller Co.....Cleveland.
**BOILER STAYBOLTS, IRON OR
STEEL, HOLLOW OR
SOLID.**
Falls Hollow Staybolt Co.....
.....Cuyahoga Falls, O.

BRASS AND BRONZE CASTINGS.
Cramp, Wm. & Sons....Philadelphia.
Fore River Ship & Engine Co.....
.....Quincy, Mass.
Great Lakes Engineering Works..
.....Detroit.
Lunkenheimer Co.....Cincinnati.

BRIDGES, BUILDERS OF.
Scherzer Rolling Lift Bridge Co....
.....Chicago.

BUCKETS, ORE AND COAL.
Brown Hoisting & Conveying Ma-
chine Co.....Cleveland.
G. H. Williams Co.....Cleveland.

**CABIN AND CABINET
FINISHING WOODS.**
Martin-Barriss Co.....Cleveland.

CANVAS SPECIALTIES.
Baker & Co., H. H.....Buffalo.
Bunker, E. A.....New York.
Upson-Walton Co.....Cleveland.

CAPSTANS.
American Ship Windlass Co.....
.....Providence, R. I.
Dake Engine Co.....
.....Grand Haven, Mich.

Hyde Windlass Co.....Bath, Me.
Marine Mfg. & Supply Co.....
.....New York.

**CEMENT, IRON FOR REPAIR-
ING LEAKS.**
Smooth-On Mfg. Co.....
.....Jersey City, N. J.

CHAIN SURVEYORS, HOISTS.
Brown-Hoisting Machinery Co.....
.....Cleveland.
General Electric Co.....
.....Schenectady, N. Y.

CHAIN HOISTS.
Boston & Lockport Block Co.....
.....Boston, Mass.

CHARTS.
Penton Publishing Co....Cleveland

CHECK VALVES.
Scoville Check Valve Co., Ashtabula, O.

**CLOCKS (Marine and Ship's Bell)
AND CHRONOMETERS.**
Ritchie, E. S. & Sons.....
.....Brookline, Mass.

CLOTHING, WATERPROOF.
Armstrong, E. A. Mfg. Co....Chicago.

**COAL PRODUCERS AND
SHIPPERS.**
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co....Cleveland.
Pittsburg Coal Co.....Cleveland.

**COAL AND ORE HANDLING
MACHINERY.**
Brown-Hoisting Machinery Co.....
.....Cleveland.

COMPASSES.
Ritchie, E. S. & Son.....
.....Brookline, Mass.

CONDENSERS.
Great Lakes Engineering Works....
.....Detroit.
Wheeler Condenser & Engineering
Co.....New York.

**CONTRACTORS FOR PUBLIC
WORKS.**

Breymann Bros., G. H.....Toledo.
Buffalo Dredging Co.....Buffalo.
Dunbar & Sullivan Dredging Co....
.....Buffalo.
Great Lakes Dredge & Dock Co....
.....Chicago.
Hickler Bros.....Sault Ste. Marie, Mich.
Hubbell Co., H. W..Saginaw, Mich.
Smith Co., L. P. & J. A..Cleveland.
Starke Dredge & Dock Co., C. H..
.....Milwaukee.
Standard Contracting Co..Cleveland.
Sullivan, M.....Detroit.

CORDAGE.
Baker & Co., H. H.....Buffalo.
Upson-Walton Co.....Cleveland.

G. H. Breymann & Bro's

CONTRACTORS FOR
PUBLIC WORKS

Dredging, Dock Building, Etc.

5, 6 AND 7 MARINE BUILDING
TOLEDO, OHIO.

Great Lakes Dredge & Dock Company

RIVER AND HARBOR IMPROVEMENTS

Foundations, Bridges, Piers, Breakwaters,
Lighthouses, Tunnels, Pneumatic
and Submarine Work.

CHICAGO

DULUTH

CLEVELAND

TOLEDO

SAULT STE. MARIE

Buffalo Dredging Co.

GENERAL CONTRACTORS
ON
SUBMARINE WORK

Office
D. S. Morgan Bldg.

BUFFALO, N. Y.

Dunbar and Sullivan DREDGING Company

BUFFALO, N. Y.

REMOVE SUBMARINE
ROCK OR EARTH

Hickler Brothers

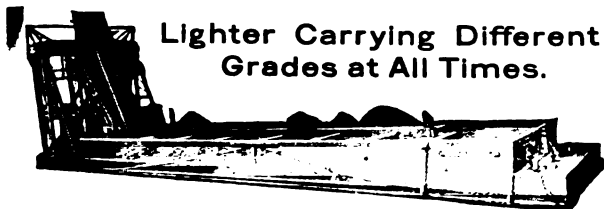
SAULT STE. MARIE, MICH.

MARINE RAILWAY

Capacity, 1,000 tons. Draft, 7½ ft.
forward, 13½ ft. aft. Length on
keel blocks, 180 ft.; over all, 190 ft.

Machine Shop, Foundry and Steam Forge,
Dredges, Drill Boats and Derrick Scows.

Steamboat Fuel at Ashtabula
Large Supplies of Best Quality.



Fuel Scow with elevators and discharging spouts. Storage of 800 tons.
Discharges 250 tons an hour into steamers while unloading cargo.

M. A. Hanna & Co., Miners and Shippers.

Main Office, Perry-Payne Bldg., Cleveland.

H. W. HUBBELL CO.

Submarine Work
of all kinds

Dredging Hard Material a Specialty.

SAGINAW

MICH.

Buyers' Directory of the Marine Trade.—Continued.

CORK JACKETS AND RINGS.

Armstrong Cork Co., Pittsburg, Pa.
Kahnweiler's Sons, D., New York.

CRANES, TRAVELING.

Brown-Hoisting Machinery Co.,
Cleveland.

DIVING APPARATUS.

Morse, A. J. & Son, Boston.
Schrader's Son, Inc., A., New York.

DREDGING CONTRACTORS.

Breyman & Bros., G. H., Toledo.
Buffalo Dredging Co., Buffalo.
Dunbar & Sullivan Dredging Co.,
Buffalo.
Great Lakes Dredge & Dock Co.,
Chicago.
Hickler Bros.,
Sault Ste. Marie, Mich.
Hubbell Co., H. W., Saginaw, Mich.
Starke Dredge & Dock Co., C. H.,
Milwaukee.
Sullivan, M., Buffalo.

DREDGING MACHINERY.

Quintard Iron Works Co., New York.
Superior Iron Works, Superior, Wis.

DRY DOCKS.

American Ship Building Co.,
Cleveland.
Atlantic Works, East Boston, Mass.
Buffalo Dry Dock Co., Buffalo.
Chicago Ship Building Co.,
Chicago.
Cramp, Wm. & Sons, Philadelphia.
Detroit Ship Building Co.,
Detroit.
Great Lakes Engineering Works,
Detroit.
Lockwood Mfg. Co.,
East Boston, Mass.
Milwaukee Dry Dock Co.,
Milwaukee.
Newport News Ship Building Co.,
Newport News, Va.
Shipowners' Dry Dock Co., Chicago.
Superior Ship Building Co.,
Superior, Wis.
Tietjen & Lang Dry Dock Co.,
Hoboken, N. J.
Toledo Ship Building Co., Toledo.

DYNAMOS.

General Electric Co.,
Schenectady, N. Y.

ELECTRIC HOISTS AND CRANES.

General Electric Co.,
Schenectady, N. Y.

ELECTRIC LIGHT AND POWER PLANTS.

General Electric Co.,
Schenectady, N. Y.

ENGINE BUILDERS, MARINE.

American Blower Co., Detroit, Mich.
American Ship Building Co.,
Cleveland.
Atlantic Works, East Boston, Mass.
Briggs, Marvin, New York.
Chicago Ship Building Co., Chicago.
Chase Machine Co., Cleveland.
Cramp, Wm. & Sons, Philadelphia.
Detroit Ship Building Co., Detroit.
Fletcher, W. & A. Co., Hoboken, N. J.
Fore River Shipbuilding Co.,
Quincy, Mass.
Great Lakes Engineering Works,
Detroit, Mich.
Hall Bros., Philadelphia.

ENGINE BUILDERS—Continued.

Lockwood Mfg. Co.,
East Boston, Mass.
Maryland Steel Co.,
Sparrows Point, Md.
Milwaukee Dry Dock Co., Milwaukee.
Mosher, Chas. D., New York.
Newport News Ship Building Co.,
Newport News, Va.
New York Ship Building Co.,
Camden, N. J.
Northwestern Steam Boiler & Mfg.
Co., Duluth, Mich.
Quintard Iron Works Co., New York.
Roach's Ship Yard, Chester, Pa.
Sheriffs Mfg. Co., Milwaukee.
Superior Ship Building Co.,
Superior, Wis.
Thropp, J. E. & Sons Co.,
Trenton, N. J.
Toledo Ship Building Co., Toledo.
Trout, H. G., Buffalo.

ENGINE ROOM TELEGRAPH CALL BELLS, ETC.

Cory, Chas. & Son, New York.
Marine Mfg. Supply Co., New York.

ENGINEERING SPECIALTIES AND SUPPLIES.

Lunkenheimer Co., Cincinnati.
Northwestern Steam Boiler & Mfg.
Co., Duluth, Minn.

ENGINEERS, MARINE, MECHANICAL, CONSULTING.

Furstenau, M. C., Philadelphia.
Hynd, Alexander, Cleveland.
Hunt, Robt. W. & Co., Chicago.
Kidd, Joseph, Duluth, Minn.
Mosher, Chas. D., New York.
Nacey, James, Cleveland.
Roelker, H. B., New York.
Wood, W. J., Chicago.

FANS.

American Blower Co., Detroit, Mich.

FEED WATER PURIFIERS AND HEATERS.

Ross Valve Co., Troy, N. Y.
Wheeler Condenser & Engineering
Co., New York.

FIXTURES FOR LAMPS, OIL OR ELECTRIC.

General Electric Co.,
Schenectady, N. Y.

FORGINGS FOR CRANK, PROPELLER OR THRUST SHAFTS, ETC.

Cleveland City Forge & Iron Co.,
Cleveland.
Fore River Shipbuilding Co.,
Quincy, Mass.

FLUE WELDING.

Fix's S. Sons, Cleveland.

FUELING COMPANIES AND COAL DEALERS.

Hanna, M. A. & Co., Cleveland.
Parker Bros. Co., Ltd., Detroit.
Pickands, Mather & Co., Cleveland.
Pittsburg Coal Co., Cleveland.
Smith, Stanley B., & Co., Detroit.
Toledo Fuel Company, Toledo, O.

FURNACES FOR BOILERS.

Continental Iron Works, New York.

GAS BUOYS.

Safety Car Heating & Lighting Co.,
New York.

GAS AND GASOLINE ENGINES.

Chase Machine Co., Cleveland.

GAUGES, STEAM AND VACUUM.

Lunkenheimer Co., Cincinnati.

GAUGES, WATER.

Lunkenheimer Co., Cincinnati, O.

GENERATING SETS.

General Electric Co.,
Schenectady, N. Y.

GRAPHITE.

Dixon Crucible Co., Joseph,
Jersey City, N. J.

HAMMERS, STEAM.

Chase Machine Co., Cleveland.

HEATING AND VENTILATING APPARATUS.

American Blower Co., Detroit, Mich.

HOISTS FOR CARGO, ETC.

American Ship Building Co.,
Cleveland.
Brown Hoisting Machinery Co.,
Cleveland.
Chase Machine Co., Cleveland.
Dake Engine Co.,
Grand Haven, Mich.
General Electric Co., New York.
Hyde Windlass Co., Bath, Me.
Marine Iron Co., Bay City.

HOLLOW STAYBOLT IRON.

Falls Hollow Staybolt Co.,
Cuyahoga Falls, O.

HYDRAULIC DREDGES.

Great Lakes Engineering Works,
Detroit.

HYDRAULIC TOOLS.

Watson-Stillman Co., The,
New York.

ICE MACHINERY.

Great Lakes Engineering Works,
Detroit.
Roelker, H. B., New York.

INJECTORS.

American Injector Co., Detroit.
Jenkins Bros., New York.
Lunkenheimer Co., Cincinnati.
Penberthy Injector Co.,
Detroit, Mich.

INSURANCE, MARINE.

Atlantic Mutual Insurance Co.,
New York.
Belcher, Fred P., Winnipeg.
Elphicke, C. W. & Co., Chicago.
Gilchrist & Co., C. P., Cleveland.
Hawgood & Co., W. A., Cleveland.
Helm & Co., D. T., Duluth.
Hutchinson & Co., Cleveland.
McCarthy, T. R., Montreal.
McCurdy, Geo. L., Chicago.
Mitchell & Co., Cleveland.
Parker Bros. Co., Ltd., Detroit.
Peck, Chas. E. & W. F.,
New York and Chicago.
Prindiville & Co., Chicago.
Richardson, W. C., Cleveland.
Sullivan, D. & Co., Chicago.
Vance & Joys Co., Milwaukee.

M. SULLIVAN

DREDGING OF ALL KINDS

THE REMOVING OF DEEP
WATER EARTH AND ROCK
A SPECIALTY. - - -

721 West Ferry St.
BUFFALO, - - - N. Y.

THE
Standard Contracting Co.

ENGINEERS AND CONTRACTORS

For Railroads, Dredging, Dock Build-
ing, Concrete, Submarine work, &c.

Wade Building

Cleveland, Ohio

C. H. STARKE DREDGE & DOCK CO.,

Contractors for Public Works.

DREDGING, PILE DRIVING,
— AND —
SUBMARINE PIPE LAYING.

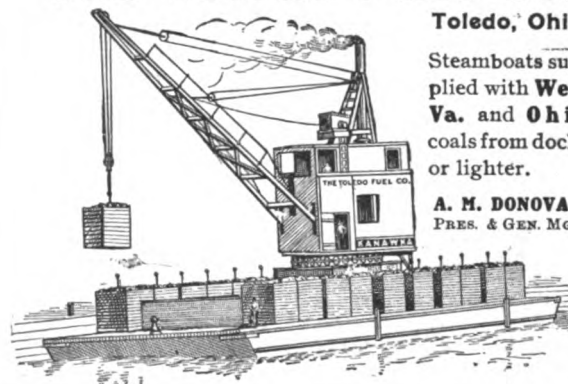
Canal Street, West of First Avenue,
Milwaukee, - - - Wisconsin.

The Toledo Fuel Co.

Toledo, Ohio

Steamboats sup-
plied with West
Va. and Ohio
coals from docks
or lighter.

A. M. DONOVAN,
PRES. & GEN. MGR.

**GEO. STRATFORD OAKUM CO.**

JERSEY CITY, NEW JERSEY.

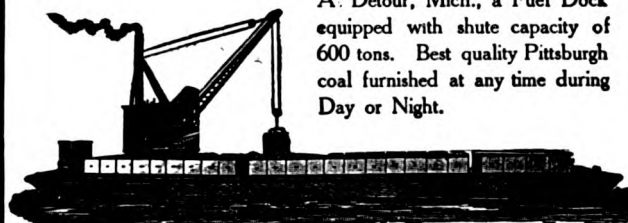
Established
1880Manufacturers
of all grades of**Oakum**Spun
Cotton

FOR SALE AT SHIP CHANDLERS EVERYWHERE.

PICKANDS, MATHER & CO.

FUEL LIGHTERS at Buffalo, Erie, Ashtabula and Cleveland.

A. Detour, Mich., a Fuel Dock
equipped with shute capacity of
600 tons. Best quality Pittsburgh
coal furnished at any time during
Day or Night.



Western Reserve Building,

CLEVELAND, O.

Atlantic Mutual Insurance Company

Atlantic Building, 51 Wall Street, New York

Insures against marine and inland transportation risk and will issue
policies making loss payable in Europe and Oriental countries.

Chartered by the State of New York in 1842, was preceded by a stock
company of a similar name. The latter company was liquidated and part of its
capital, to the extent of \$100,000, was used, with consent of the stockholders, by
the Atlantic Mutual Insurance Company and repaid, with a bonus and interest,
at the expiration of two years.

During its existence the company has insured prop-
erty to the value of - - - \$21,108,343.494.00

Received premiums thereon to the extent of - - - 224,197,211.06

Paid losses during that period - - - 127,760,071.08

Issued certificates of profits to dealers - - - 81,310,840.00

Of which there have been redeemed - - - 73,744,440.00

Leaving outstanding at present time - - - 7,566,400.00

Interest paid on certificates amounts to - - - 19,469,981.85

On Dec. 31, 1905, the assets of the company amounted to - - - 12,716,427.62

The profits of the company revert to the assured and are divided annually
upon the premiums terminated during the year, thereby reducing the cost of
insurance.

For such dividends, certificates are issued subject to dividends of interest
until ordered to be redeemed, in accordance with the charter.

ANTON A. RAVEN, Pres.

CORNELIUS ELDERT, Vice-Pres.

THEO. P. JOHNSON, 2nd Vice-Pres.

JAS. L. LIVINGSTON, 3rd Vice-Pres.

G. STANTON FLOYD-JONES, Secretary.

Iron and Brass Foundry
in ConnectionPhone, Main 785
Bell 135 W**McLaughlin Iron Works**

Engines, Boilers, Mill
Machinery and
General Repairing

Marine Repair Work a specialty
Let us figure on yours

180 Center Street

ASHTABULA, OHIO

Buyers' Directory of the Marine Trade---Continued.

IRON ORE AND PIG IRON.
Bourne-Fuller Co.....Cleveland, O.
Hanna, M. A. & Co.....Cleveland.
Pickands, Mather & Co., Cleveland.

**LAUNCHES—STEAM, NAPHTHA,
ELECTRIC.**
Truscott Boat Mfg. Co.....
.....St. Joseph, Mich.

**LIFE PRESERVERS, LIFE
BOATS, BUOYS.**
Armstrong Cork Co.....Pittsburg.
Carley Life Float Co.....
.....New York, N. Y.
Drein, Thos. & Son.....
.....Wilmington, Del.
Kahnweiler's Sons, D....New York.

LOGS.
Nicholson Ship Log Co., Cleveland.
Walker & Sons, Thomas.....
.....Birmingham, Eng.

LUBRICATING GRAPHITE.
Dixon Crucible Co., Joseph.....
.....Jersey City, N. J.

LUBRICATORS.
Lunkenheimer Co. Cincinnati.

LUMBER.
Martin-Barriss Co. Cleveland.

MACHINISTS.
Chase Machine Co.....Cleveland.
Hickler Bros., Sault Ste. Marie, Mich.
Lockwood Mfg. Co.....
.....East Boston, Mass.
McLaughlin Iron Works, Ashtabula, O.
Superior Iron Works, Superior, Wis.

**MACHINE TOOLS (WOOD
WORKING).**
Atlantic Works, Inc....Philadelphia.

MARINE RAILWAYS
Hickler Bros., Sault Ste. Marie, Mich.

**MARINE RAILWAYS, BUILD-
ERS OF,**
Crandall & Son, H. I.....
.....East Boston, Mass.

MARINE TORCHES.
Marine Torch Co.....Baltimore.

**MATTRESSES, CUSHIONS,
BEDDING.**
Fogg, M. W.....New York

**MECHANICAL DRAFT FOR
BOILERS.**
American Blower Co.,Detroit.
American Ship Building Co.....
.....Cleveland.
Detroit Ship Building Co., Detroit.
Great Lakes Engineering Works....
.....Detroit.

METALLIC PACKING.
Katzenstein, L. & Co., New York.
The National Metallic Packing Co..
.....Oberlin, O.

**MOTORS, GENERATORS—
ELECTRIC.**
General Electric Co.....
.....Schenectady, N. Y.

NAUTICAL INSTRUMENTS.
Ritchie, E. S., & Sons.....
.....Brookline, Mass.

NAVAL ARCHITECTS.
Curr, RobertCleveland
Hynd, AlexanderCleveland
Kild, JosephDuluth, Minn.
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Coast-Charts Nos. 5, 6, 7, 8
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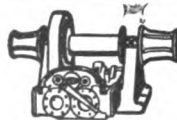
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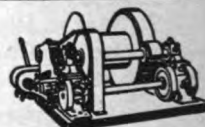
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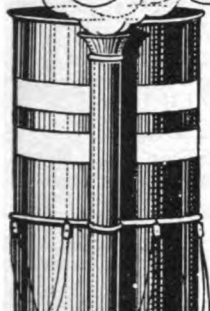
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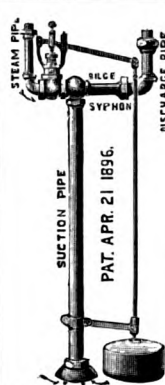
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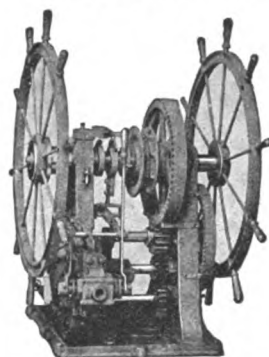
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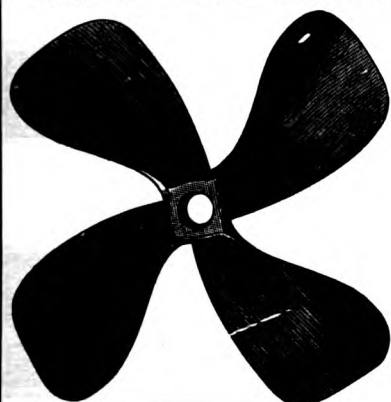


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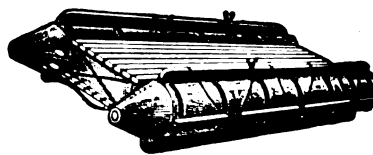
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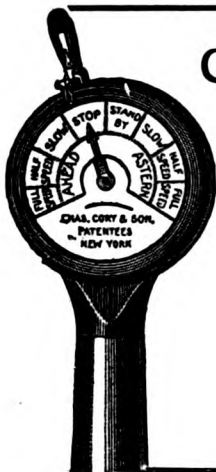
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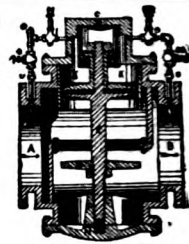
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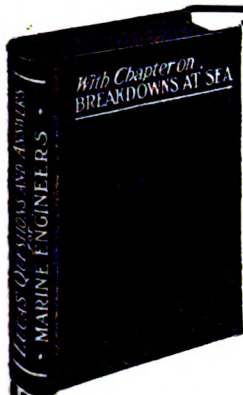
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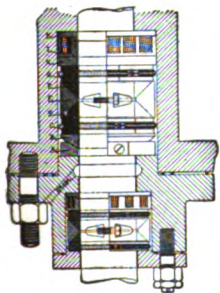
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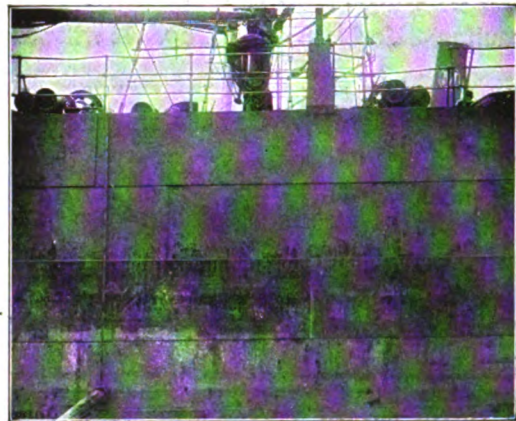
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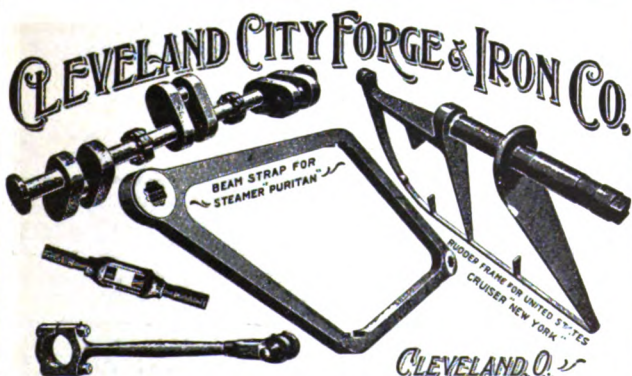
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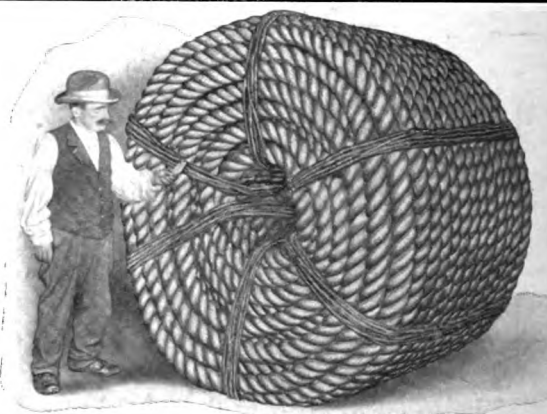
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